UNION OF SOUTH AFRICA
UNIE VAN SUID-AFRIKA

DEPARTMENT OF MINES DEPARTEMENT MYNWESE

GEOLOGICAL SURVEY
GEOLOGIESE OPNAME

# NORTHERN NATAL COAL-FIELD (AREA NO. 2) THE UTRECHT AREA

# RECORDS OF BORE-HOLES 1 TO 31 DRILLED FOR THE DEPARTMENT OF MINES

BULLETIN 29

With notes by
K. H. L. Sehlke and S. W. van der Merwe

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DIE STEENKOOLVELD VAN NOORDELIKE NATAL (GEBIED 2),
DIE GEDEELTE NOORD VAN UTRECHT
STATE VAN BOORGATE 1 TOT 31

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K. H. L. Sehlke, D.Sc. (Geological Survey) and
S. W. van der Merwe, M.Sc. (Fuel Research Institute)

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# DEPARTEMENT MYNWESE

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# CONTENTS

## PART I.- GEOLOGICAL

I.- INTRODUCTION .............................. 1

II.- GENERAL GEOLOGY ......................... 2

III.- THE COAL-SEAMS .......................... 6

IV.- NATURAL OIL ............................. 14

V.- RESERVES ................................ 14

## PART II. - CHEMICAL AND PHYSICAL

I.- INTRODUCTION ............................ 19

II.- EFFECT OF DOLERITE ON THE COAL-SEAMS ..... 21

III.- GENERAL CHARACTERISTICS OF THE COAL-SEAMS. 23

IV.- ULTIMATE AND OTHER ANALYSIS .............. 35

V.- THE BORE-HOLE RECORDS .................... 37

Bore-hole 1 : Boshoek 183
Bore-hole 2 : Noyeesboom 68
Bore-hole 3 : Klipplaatdrift 120
Bore-hole 5 : Dageraad 49
Bore-hole 6 : Politiek 67
Bore-hole 7 : Welgevonden 50
Bore-hole 8 : Uitzicht 113
Bore-hole 9 : Klipplaatdrift 120
Bore-hole 14 : Gaatweel 118
Bore-hole 15 : Pivaanspoort 56 (Diepkloof)
Bore-hole 16 : Gaatweel 118
Bore-hole 17 : Hammer 6
Bore-hole 18 : Weihoek 171
Bore-hole 19 : Klipspruit 178
Bore-hole 20 : Vaalbank 103
Bore-hole 21 : Pivaans Water Vaal 267
Bore-hole 22 : Pivaans Water Vaal 267
Bore-hole 23 : Elandsnek 4
Bore-hole 24 : Klipplaatdrift 120
Bore-hole 25 : Elandsnek 4
Bore-hole 26 : Klipplaatdrift 120
Bore-hole 27 : Rustverwacht 151
Bore-hole 28 : Schurvekopje 147

Bore-hole 29 : Welgevonden 93
Bore-hole 30 : Kalkkrans 313
Bore-hole 31 : Jericho 198

TABLE 1. DESCRIPTION OF SAMPLES .................. 96

TABLE 2. ANALYSIS OF SAMPLES ..................... 107

TABLE 3. COMPOSITION OF SAMPLES FOR FURTHER ANALYSES .......................... 117

TABLE 4. DRY ASH-FREE ULTIMATE ANALYSIS OF COMPOSITE SAMPLES ..................... 120

TABLE 5. ASH FUSION TEMPERATURES OF COMPOSITE SAMPLES .......................... 120

AFRIKAANS SUMMARY ................................ 121

LOOSE FOLDERS

Locality map

Columnar sections, bore-holes 1-31

# PART I. - GEOLOGICAL

by K.H.L. Sehlke, Geological Survey

# I. - INTRODUCTION

The Utrecht area was geologically surveyed by J.J.G. Blignaut and F.J.J. Furter during 1937-39. The results of the survey were described in "Coal Survey Memoir 2, The Northern Natal Coal-field (Area No.2)" of the Geological Survey, published in 1952.

The Coal Commission of 1946-47 recommended that prospecting for coking coal by means of drilling should be carried out by the State and that this prospecting programme should be controlled by the Coal Advisory Board.

It was further recommended that a sum of £750,000 should be made available by the State for the carrying out of the prospecting over a period of seven years.

During September 1951 the Coal Advisory Board was constituted and, instead of a sum of £750,000 originally recommended by the Coal Commission, a sum of £70,000, later on increased to £100,000, was placed at the disposal of the Board to carry on prospecting for coking coal by means of drilling. The area to the north of Utrecht (the Balelasberg) was one of the areas recommended by the Commission to be investigated for its potential coking coal resources, and with this end in view drilling was commenced during April 1952 and completed in 1958.

The 26 bore-holes (numbered 1 to 31, with the omission of numbers 4, 10, 11, 12, 13) were drilled by the Irrigation Department. The positions of these bore-holes in relation to farm-boundaries, their elevations above sea-level, and their columnar sections are shown on a locality map and diagram, both of which appear as loose folders at the end of this bulletin.

As there are insufficient exposures of the coal-bearing beds, these bore-holes, besides being a source of coal-cores for analysis, supplied valuable information about: (i) the number of coal-seams present, (ii) a correlation of the various coal-seams, (iii) the persistence of the coal-seams, (iv) the boundaries between some of the geological formations, and (v) the positions of fa

## II. - GENERAL GEOLOGY

The country north of Utrecht is in general a highly dissected plateau between 5,000 and 6,000 feet above sea-level, and represents a spur of the Drakensberg that extends eastwards from Volksrust and Wakkerstroom on the Transvaal border to form the watershed between the Buffalo and the Pongola Rivers. The plateau rises to its highest point (6,747 feet) at the Vaalkop trigonometrical station.

The eastern portion of the area is deeply dissected by the headwaters of the Pivaan and Blood Rivers. The southern escarpment of the Plateau extends from the valley of the Blood River northwestwards to Charlestown. The Buffalo flats, a wide sandy plain with a mean elevation of 4,000 feet above sea-level, lies south of the Balelasberg escarpment and southwest of Utrecht.

The Pivaan River originates on the eastern slopes of the Thabankulu Mountains and flows eastwards to Pivaans

Water Vaal 267.

The rivers are all perennial streams, becoming swollen during the summer rainy season. Springs are numerous in the mountainous area, and provide a good supply of water. They are usually found issuing along the contact of a dolerite sheet with underlying or overlying sediments, along dykes, or from outcrops of coal or shale.

The strata of the Karroo System may for all practical purposes be regarded as horizontal; there is an almost imperceptible dip to the south. The system has been invaded extensively by dolerite sheets and dykes of Post-Karroo age.

The following succession of Karroo rocks has been determined:

| Subdivision of Karroo System | Representative rocks | Thickness |
|---|---|---|
| Lower Beaufort Stage | Sandstone, shaly sandstone, sandy shale, shale | 40 to 270 ft. |
| Upper Ecca Stage | Shale, blue grey, more or less indurated | 30 to 475 ft. |
| Middle Ecca Stage | Sandy shale, shaly sandstone, fine- to coarse-grained, gritty sandstone, intercalated black shale bands and coal-seams | 345 to 940 ft. |
| Lower Ecca | Sandy shale, shale | 10 to 70 ft. |

As most bore-holes penetrate no further than about 80 feet below the bottom coal-seam, the Dwyka has not been intersected. The different formations will be considered in ascending order:

(i) The Lower Ecca Stage is predominantly shaly and becomes progressively more sandy towards the contact with the lower transition beds of the Middle Ecca Stage. The Lower Ecca shales have been encountered in bore-hole 31 on Jericho 198. None of the bore-holes has penetrated the entire succession of the Lower Ecca Stage.

(ii) The Middle Ecca Stage has the following divisions:

The upper transition beds,
The upper sandstones,
The coal-zone,
The lower sandstones,
The lower transition beds.

The lower transition beds consist of sandy, micaceous shale and thinly bedded shaly sandstone. In bore-hole 17 on Hammer 6 the lower transition beds are made up of alternating bands of sandstone and shale lying some 70 feet below the lower sandstones. They merge gradually into this zone of medium- to coarse-grained, gritty, cross-bedded sandstone with intercalated bands of shaly sandstone and sandy shale. The top of the lower sandstones is formed by the Targas Seam, i.e. about 20 feet below the Coking Seam.

The coal-zone is defined by the base of the upper sandstones, 50 feet below the Eland Seam, and the roof of the lower sandstones. In the area under consideration the coal-zone ranges in thickness from 300 to 450 feet, with an average of 330 feet. The main coal-zone occurs approximately in the middle of the coal-zone, and contains coal-seams that attain workable thicknesses of usually more than 3 feet. To the north of Utrecht the main coal-zone contains four major seams. From the top to the bottom these are: The Alfred, the Gus (which splits up into the Upper and the Lower Gus), the Dundas, and the Coking Seam. Minor seams occur above, below, and between the major seams of the main coal-zone.

At the Utrecht Colliery the Alfred Seam is named the Moss, the Upper Gus the Main, and the Dundas Seam the Yard. The main coal-zone has an average thickness of 170 feet.

The upper sandstones and the lower sandstones are used as markers in determining the main coal-zone. In the field the coal-zone, with its underlying and overlying sandstones, is encountered in the Burgers Pass on the road to Noyeesboom 68, and in the escarpment south of the Balelasberg in the western part of the Utrecht District.

The upper sandstones range in thickness from about 180 to 390 feet, i.e. the bottom is taken at 50 feet above the Alfred Seam.

The upper transition beds range in thickness from 20 to 55 feet. They consist of a succession of bands of sandy shale and shaly sandstone and resemble the lower transition beds. In the roof they merge into the Upper Ecca shale with sandy shale types.

(iii) The Upper Ecca Stage is a shale group and consists mainly of blue-grey, fine-grained, partly indurated shale. Judging by bore-hole evidence this stage ranges in thickness from 30 to 475 feet. The maximum thickness of 475 feet has been encountered in bore-hole 30 on Kalkkrans 313, northwest of Utrecht.

(iv) The basal part of the Lower Beaufort Beds encountered in the bore-holes is similar to the Middle Ecca beds and consists of fine- to medium-grained, massive sandstone, sandy shale, shaly sandstone, shale, and coal-seams of no economic value.

Different types of dolerite have been identified. The thickest sill encountered was of the Zuinguin type and reached a thickness of 460 feet in bore-hole 17 on Hammer 6. The relations between some of the sheets are shown in the geological profile on the locality map. The great depth of the coal-seams in the Balelasberg is partly attributed to the excessive thickness of the dolerite sheets, which have intruded the Karroo Beds with a maximum of some 800 feet in bore-hole 31 on Jericho 198. The deepest bore-hole (elevation 6,380 feet), with 638 feet of dolerite, has been drilled to 1,926 feet on Schurvekopje 147.

## III. - THE COAL-SEAMS

The nomenclature that has been adopted for the seams in the portion north of Utrecht is nearly the same as that used in Coal Survey Memoir No.2 for the seams in the Utrecht-Newcastle area.

In the following table variations in the thickness of the strata between the coal-seams present in the area are given. The seams of workable thickness at certain localities are the Alfred (Moss), the Gus (splitting into its Upper and Lower members), the Dundas (Yard) and the Coking Seams.

| | Formation | Thickness |
|---|---|---|
| Eland: | | |
| Upper Eland | Coal .................. | 0 to 10 in. |
| | Sandstone and shale .. | 10 to 20 ft. |
| Lower Eland | Coal .................. | 1 to 12 in. |
| | Sandstone and shale .. | 110 to 125 ft. |
| Fritz | Coal .................. | 0 to 12 in. |
| | Sandstone and shale .. | 15 to 35 ft. |
| Alfred (Moss) | Coal.................. | 1 to 59 in. |
| | Mainly gritty, coarse-grained sandstone ... | 18 to 45 ft. |
| Rider | Coal.................. | 0 to 16 in. |
| | Mainly coarse-grained sandstone and shale.. | 7 to 25 ft. |
| Gus: | | |
| Upper Gus (Main) | Coal .................. | 12 to 57 in. |
| | Sandy shale and shaly sandstone, coarse-grained sandstone | 12 to 40 ft. |
| Lower Gus | Coal .................. | 10 to 58 in. |
| | Medium- to coarse-grained sandstone | 20 to 55 ft. |
| Dundas (Yard) | Coal .................. | 1 to 56 in. |
| | Sandstone and sandy shale | 5 to 15 ft. |
| Seam "Z" | Coal .................. | 0 to 10 in. |
| | Sandstone and sandy shale | 20 to 45 ft. |
| Coking | Coal .................. | 6 to 29 in. |
| | Sandstone and sandy shale | 10 to 25 ft. |
| Targas | Coal .................. | 4 to 10 in. |

In the following the coal-seams are described in descending order.

## A. THE ELAND SEAM

The Eland Seam, which splits up into the Upper and Lower Eland, is situated nearly 140 feet above the Alfred Seam, and occurs at the top of the coal-zone. It ranges in thickness from 1 to 10 inches, falls into the category of minor seams, and is of no economic value. The seams generally consists of bright coal, and occasionally of dull coal. It is fairly persistent over the portion north of Utrecht and forms a useful marker for correlation purposes.

The roof of the Upper Eland consists of sandstone with thin shale bands. The sandstones vary from white, medium-grained types to fine-grained, grey and shaly. Thin shale bands up to 12 inches thick lie above and below the Upper Eland. The Lower Eland is separated from the Upper by about 15 feet of grey, fine- to medium-grained sandstone with intercalated shale bands that range in thickness from 2 to 8 feet.

The Lower Eland ranges in thickness from 1 to 12 inches, consists mainly of bright coal, and may split into two or three thin subsidiary bands. The shales are dark and carbonaceous. The roof of the Lower Eland consists of fine- to medium-grained sandstone with subordinate black shale bands from 4 to 8 feet thick.

The floor of the seam has a thickness of from 6 to

15 feet, and consists of grey, shaly, micaceous, here and there calcareous, fine- to medium-grained sandstone. A thin carbonaceous shale band is in places present between the floor and the coal.

## B. THE FRITZ SEAM

The Fritz Seam has a maximum thickness of 12 inches, and consists for the larger part of a somewhat pyritic, bright coal, and carbonaceous shale. Here and there the coal is dull and shaly, as in bore-hole 30 on Kalkkrans 313. This minor seam is generally encountered about 25 feet above the Alfred Seam. Where it is absent, it is in places represented by a carbonaceous shale band.

The roof of the Fritz Seam consists of grey, shaly sandstone with intercalated shale layers ranging from 5 to 30 feet in thickness. The floor of the seam consists mainly of grey, thinly bedded sandstone, sandy shale, and carbonaceous shale. The last-mentioned has a thickness of 3 to 12 inches.

## C. THE ALFRED (MOSS) SEAM

The Alfred (Moss) Seam, situated at the top of the main coal-zone, ranges in thickness from 12 to 59 inches, and consists mainly of dull, shaly coal with occasional bright coal stringers, merging in places into carbonaceous shale. Towards the bottom the coal is brighter. Considering the portion north of Utrecht as a whole it may be deduced from the records of bore-holes situated in the most northern portion of the area under consideration, that the Alfred Seam ranges in thickness from 2 to 3 feet. However, in bore-hole 20 on Vaalbank 103, bore-hole 28 on Schurvekopje 147, bore-hole 30 on Kalkkrans 313, and in bore-hole 31 on Jericho 198 the seam ranges in thickness from 4 to 5 feet, this maximum being attained in bore-hole 30. It therefore increases in thickness over a distance of 20 miles from east to west. Despite its workable thickness this seam is of no economic value on account of its inferior quality.

The roof consists mainly of white, medium-grained sandstone, and shaly sandstone. The thickness ranges from 10 to 25 feet.

The floor of the seam also consists of sandstone, which is generally more coarse-grained and gritty than in the roof. At the base of the seam the sandstone is often shaly. The thickness of the sandstone ranges from 10 to 45 feet. In places a band of black, carbonaceous shale, from 1 to 12 inches thick, occurs between the coal and the sandstone.

## D. THE RIDER SEAM

The Rider Seam falls into the category of minor seams, and in the portion north of Utrecht it attains a maximum thickness of 16 inches in bore-hole 9 on Klipplaatdrift 120. The seam lies some 30 feet on the average below the Alfred Seam, and is fairly persistent over the whole area. The coal varies from bright to dull. Occasionally, as in bore-holes 8, 21, 26, and 30, it splits into two thin bands.

The roof of the seam generally consists of coarse-grained, gritty sandstone from 10 to 20 feet thick. The floor of the seam, between 4 and 10 feet thick, is comprised of grey, cross-bedded and white, fine- to coarse-grained sandstone, sandy shale, and black, carbonaceous shale that is up to 2 feet thick.

## E. THE GUS SEAMS

Generally there are two seams in this area: The Upper Gus and the Lower Gus. In places where only one seam is present it has been called the Gus Seam. Both the Upper and the Lower Gus attain workable widths. The Upper Gus (Main) ranges in thickness from 12 to 57 inches; the latter figure is attained in bore-hole 19 on Klipspruit 178. It consists of alternating bands of dull and bright coal, and is in places somewhat calcitic and pyritic in composition. The seam is very erratic in thickness. On the whole, however, it seems to increase in thickness to the west. In places thin bands of carbonaceous shale are present either at the top or at the base of both seams.

The roof is mainly comprised of medium- to coarse-grained sandstone, and sandy shale ranging in thickness from 10 to 20 feet. The floor of the seam also consists of shaly sandstone, and fine- to medium-grained sandstone. The thickness of the sandstone ranges from 8 to 10 feet.

The Upper Gus is separated from the Lower Gus by some 25 feet of sediments.

The Lower Gus ranges in thickness between 10 and 58 inches, and consists mainly of dull coal with a few bright coal bands. This seam attains its maximum thickness of 4 feet 10 inches in bore-hole 24 on Klipplaatdrift 120. Northwest of Utrecht it is not present in bore-holes 5, 19, 20, 27, 28, 29, 30, 31.

The roof is from 6 to 15 feet thick, and is comprised of thinly bedded, grey, shaly sandstone, and medium- to coarse-grained sandstone. Here and there a layer of black, carbonaceous shale, up to 10 inches thick, was encountered above the coal. The floor of the Lower Gus is formed by medium- to coarse-grained sandstone and grey, shaly sandstone; these sediments are from 3 to 16 feet thick. A thin shale band up to 10 inches thick is occasionally present between the floor and the coal.

## F. THE DUNDAS (YARD) SEAM

This seam lies at an average of 50 feet below the Gus Seam, and ranges from 1 to 56 inches in thickness. The seam consists mainly of bright coal. As is apparent in the records of bore-holes 5, 7, 8, 15, 21, 25, 26, and 31 the Dundas Seam splits into several thin coal bands that range in thickness from 1 to 7 inches. The seam attains a maximum width of 56 inches in bore-hole 3 on Klipplaatdrift 120.

The roof consists of medium- to coarse-grained sandstone. A thin black, carbonaceous shale band up to 1 foot thick is occasionally present between the roof and the coal. The floor consists of sandstone and thinly bedded sandy shale ranging from 2 to 10 feet.

## G. SEAM "Z"

In the portion north of Utrecht this minor seam is mostly absent. It ranges in thickness from 1 to 10 inches, and consists mainly of dull, shaly coal, and only occasionally of bright coal. The sediments forming the roof of this seam are comprised of sandstone and sandy shale ranging from 5 to 10 feet in thickness, and the floor consists of sandy shale bands. In bore-hole 28 on Schurvekopje 147 the floor consists of a black, carbonaceous shale band, 10 inches thick.

## H. THE COKING SEAM

The Coking Seam ranges from 6 to 29 inches in thickness, and generally consists of bright coal. The seam attains its maximum thickness of 29 inches in bore-hole 1 on Boschhoek 183. The average thickness of the sediments between the Dundas and Coking Seams is 50 feet and this figure is remarkably constant. The seam becomes thinner to the northwest of Utrecht.

The roof of the seam consists of fine-grained sandstone, and sandy shale of from 10 to 20 feet. The floor consists of grey, fine-grained sandstone bands, sandy, black shale, and in places black, carbonaceous shale. The thickness ranges from 4 to 10 feet.

## I. THE TARGAS SEAM

In the area north of Utrecht this minor seam sporadically occurs 20 feet below the Coking seam. It ranges in thickness from 4 to 10 inches, and consists of mixed dull and bright coal. The roof and floor consist of thinly bedded, fine-grained sandstone, and black, carbonaceous shale.

## IV. - NATURAL OIL[+]

In four bore-holes on the Balelasberg, viz. No. 1 on Boschhoek 183, No.23 and No.25 on Elandsnek 4 and No. 28 on Schurvekopje 147, coarse-grained, gritty sandstone has been found impregnated with natural oil. The impregnations occur at random in the coal-zone. Sandstone, impregnated by petroleum in bore-hole 23, was sampled and investigated by the Fuel Research Institute. A small quantity of oil not quite enough for fractional distillation, was extracted by means of petroleum ether and carbon tetrachloride, and found to be rich in wax.

## V. - RESERVES

Klipplaatdrift 120, where four bore-holes were sunk, is the only farm where coal occurs that may be considered to be of economic value. The following reserves have been

---

[+] By P.J. Rossouw of the Geological Survey calculated on the basis of 1,800 tons per foot per acre in situ.

(i) The Upper Gus Seam lies at depths ranging from 974 to 1,213 feet, and has an average width of 3 feet and a swelling number from 1½ to 6½ .......... 40,716,000 tons.

(ii) The Dundas Seam occurs at from 992 to 1,256 feet below the surface, averages 3½ feet in width, and has a swelling number from 2 to 7 ............... 47,502,000 tons.

(iii) The Coking Seam, at depths ranging from 1,041 to 1,236 feet below the surface, a possible width of 2 feet and a swelling number of from 5 to 8, has been encountered in two bore-holes. Owing to drilling difficulties this seam has not been intersected in the other two bore-holes. ................................. 27,144,000 tons.

A reserve of some 115,362,000 tons on Klipplaatdrift 120 therefore seems to be indicated.

On the three farms Kalkkrans 313, Jericho 198 and Schurvekopje 147 the Gus Seam was proved in three bore-holes. It is only in bore-hole 28 on Schurvekopje that it reaches a thickness of 3 feet and has a swelling number of 6½. The Dundas either split up into thin bands or dropped in thickness to just over 1 foot. The Coking Seam gave a swelling number of 7½ over only 11 inches in bore-hole 28 and 4 over 2 feet in bore-hole 31, but it was very thin at Kalkkrans. Owing to the small number of bore-holes the computation of reserves on these three farms cannot be risked. The great depth of the seams coupled with the inaccessibility of the terrain militate against the economic exploitation of these coal-seams even more than would be the case at Klipplaatdrift 120.

# PART II. - CHEMICAL AND PHYSICAL

by S.W. van der Merwe, Fuel Research Institute
South Africa

# I. - INTRODUCTION

All data pertaining to the chemical and physical analyses of the coal samples obtained from bore-holes put down during this programme are contained in tables at the end of this report. Table 1 contains details of sampling of the coal-seams and gives descriptions of the samples taken and of partings. Table 2 gives the analysis of these samples. Area composite samples were made up for ultimate and other analyses. The constitution of these samples is given in Table 3, and Tables 4 and 5 contain data on ultimate analysis and ash fusion temperature carried out on the composite samples. These samples are made up by mixing different components in proportion to the thickness of the coal layer and its yield.

In cases where the thickness of the seam was not less than about 2 feet, float and sink separations were carried out on samples that were crushed to pass a 1½-inch square mesh screen.

Cores from the earlier bore-holes were washed at a specific gravity of 1.50. The resulting float fraction was fully analysed, but only the ash content of the sink fraction was determined.

Cores from the later bore-holes were floated at specific gravities of 1.40, 1.50 and 1.58 by the fractional method. The first separation was carried out at a specific gravity of 1.58. If the float yield was less than about 60 per cent. separations were not made at the other specific gravities unless there were adjacent samples that gave better results and made further separations desirable. In cases where particular specific gravity fractions were too small to justify separate analysis, they were recombined with adjacent specific gravity fractions.

The following analyses were carried out on the products obtained:

Float at 1.40 specific gravity: Proximate analysis swelling number and sulphur

Fraction 1.40 - 1.50: Ash and swelling number.

Fraction 1.50 - 1.58: Ash and swelling number.

Sink at 1.58 specific gravity: Ash.

Composite float 1.50 specific gravity: Swelling number.

Composite float at 1.58 specific gravity: Calorific value, proximate analysis, swelling number and sulphur.

In Table 2 results of analysis are given on the cumulative basis, the ash content of the float at 1.50 specific gravity having been calculated from the fractional values.

A new system of nomenclature for swelling numbers was adopted. A residue in powder form was previously denoted by the letter P. This was replaced by the figure 0. The letter F, which indicated an easily friable residue possessed of no coke structure, was replaced by the figure ½; and the symbol 1 Ag, which denoted a residue of definite coke structure but no swelling was replaced by the figure 1.

## II. - EFFECT OF DOLERITE ON THE COAL-SEAMS

Dolerite was responsible for the devolatilisation of the coal-seams in certain areas.

In the west, in bore-holes 20, 19, 27, 29, 30 and 31 all the seams were generally unaffected by igneous intrusions, the volatile matter contents ranging from 29 per cent. to 42 per cent. on all the bright coal-seams. The Alfred Seam, which is predominantly dull in nature, had a volatile matter content of about 25 per cent. The only exception to the above is the Alfred Seam in bore-hole 20. This seam was slightly affected by the thin Talana dolerite that was present about 19 feet higher up. In this case the volatile matter content was 18.5 per cent.

In the neighbouring bore-hole 28 the seams are also slightly affected; the Coking Seam to a larger extent than the Gus and Alfred Seams. Volatile matter contents for these three seams were 21.5, 27.4 and 21.9 per cent. respectively. It therefore appears probable that devolatilisation was due to underlying dolerite. However, no dolerite was penetrated in this bore-hole below the Coking Seam.

In the four bore-holes on Klipplaatdrift 120, all the main seams, except the Alfred Seam, were fairly high in volatile matter content: values of 24 to 31 per cent. were obtained. Overlying dolerite reduced the volatile matter content of the Alfred Seam, values of 10 to 16 per cent. being associated with the seam in the four bore-holes.

To the east of Klipplaatdrift 120, in bore-holes 21 and 25 and also to the south-west in bore-holes 1, 7 and 8 a certain degree of devolatilisation was caused by over- as well as underlying dolerite sheets. That both sheets must have been responsible for the reduction in volatile matter content is shown by the fact that the middle seams were generally higher in volatiles than the other seams. The presence of underlying dolerite was also proved by bore-holes 1 and 25. All the seams are, however, still bituminous in nature over the greater portion of this area, the volatile matter content of the major bright coal-seams being generally between 16 and 22 per cent. but coking properties were virtually destroyed in the great majority of the seams sampled.

In bore-holes 15 and 16 in the far east the seams were similarly affected by over- and underlying dolerite, but to a greater extent. Some of the seams are semi-anthracitic in nature and have volatile matter contents of as low as 12.6 per cent. The maximum volatile matter content of 18 per cent. is associated with the Gus Seam in bore-hole 16.

In bore-holes 22 and 23 in the north-east the major seams encountered are anthracitic with volatile matter contents of 4 to 5 per cent. Here underlying dolerite was probably responsible for the "burning" of the coal, as the overlying sheet is rather far removed from the coal-seams and there is an increase in volatile matter content from the bottom to the top of the seam sequence.

In bore-hole 22 the Dundas and Coking Seams were destroyed by the underlying dolerite and the Gus Seam was only 5 inches thick.

In bore-hole 17 only a 2½-inch coal-seam was encountered, dolerite being responsible for the virtual absence of coal.

In the remaining bore-holes - namely 5, 6, 2 and 14 in the south and south-east - all the seams were also badly burnt by overlying dolerite; here the volatile matter content ranges from 6 to 11 per cent. No dolerite was encountered in bore-hole 14, but the progressive increase of volatile matter content with depth proves that "burning" must have occurred from above. The sill responsible for the devolatilisation has probably been eroded away.

## III.- GENERAL CHARACTERISTICS OF THE COAL-SEAMS

### A. THE ELAND SEAM

Owing to insufficient cover, this seam is not present in bore-holes 20, 27 and 29 in the south-west and in bore-hole 15 in the east. In bore-holes 2, 16, and 17 in the south-east and in bore-hole 25 in the north-east it was destroyed by dolerite. It is also not represented in bore-hole 18 in the far west, as this bore-hole was commenced below the coal-zone.

This seam is present as a single entity in bore-holes 19, 30, 6, 26, 8 and 14, where the coal thickness ranges from 1 to 6 inches. It was sampled in bore-holes 30 and 14, where the ash content was 13.3 and 15.4 per cent. and the volatile matter content was 31.3 and 9.2 per cent. respectively.

Over the rest of the area the Eland Seam is in places present in two sections, which are named the Upper and Lower Eland Seams.

The Upper Eland Seam has its maximum development of 10 inches in bore-hole 23, the only locality where it was sampled. The coal has a high ash content of 26.5 per cent. and a low volatile matter content of 16.6 per cent.

The Lower Eland Seam consists of one, two or three thin bands of generally bright coal separated from each other by sandstone or shale bands up to 30 inches thick. It was sampled only in bore-hole 7, where it has an ash content of 19.3 per cent. and a volatile matter content of 23.8 per cent. over 7 inches.

## B. THE FRITZ SEAM

This seam is generally absent towards the east and south. Its best development is in the north-west in bore-holes 19, 30 and 31, where it is from 9 to 10 inches thick and consists mainly of bright coal with an ash content of 13.1 to 26.2 per cent. and a volatile matter content of about 30 per cent. Over the rest of the area the thickness exceeded 5 inches only in bore-hole 24, where it attains a thickness of 12 inches. However, this coal is rather shaly and was not sampled.

## C. THE ALFRED SEAM

Owing to insufficient cover the Alfred Seam is absent in bore-holes 18 and 27 in the west, and in bore-holes 6 and 17 it was destroyed by dolerite. In bore-holes 15 and 16 it is represented by carbonaceous shale and in bore-holes 5, 7, and 8 by shale with thin coal-bands.

Over the rest of the area the seam ranges from 20 to 40 inches in thickness, except in bore-hole 25 in the east, where it is only 13 inches thick, and in bore-holes 20, 28, 30 and 31 in the west, where thicknesses of 50 to 59 inches were obtained.

The seam is very inferior in quality in all the bore-holes except in 30 and 31 in the north-west. It consists of dull shaly coal with an ash content that is never less than 29 per cent., and carbonaceous shale. It is also badly burnt in certain areas.

In bore-holes 30 and 31 the upper portion of the seam is also inferior: the ash content is over 30 per cent. Coal of better quality occurs in its lower portion, which is only 23 and 28 inches thick in the two bore-holes. Average values for this part of the seam are given below:

| | |
|---|---|
| Thickness | 25½ inches |
| Raw Coal ash | 20.4 per cent. |

Floats of -1½ inches coal at 1.58 specific gravity:

| | |
|---|---|
| Yield | 84.5 per cent. |
| Calorific value | 11.8 lb./lb. |
| Moisture | 2.5 per cent. |
| Ash | 18.5 per cent. |
| Volatile matter | 27.3 per cent. |
| Fixed carbon | 51.7 per cent. |

Slight swelling properties are associated with this part of the seam in bore-hole 31, but these were inadequate for coke production.

## D. THE RIDER SEAM

This seam is thin and rather sporadic: it is present in only sixteen bore-holes. In places it occurs in two sections. The total coal thickness ranges from ½ to 16 inches.

It was sampled only in bore-holes 9, 24 and 26 on Klipplaatdrift 120 and in bore-hole 20 on Welgevonden 93.

On Klipplaatdrift the seam is rather inferior: the ash content is generally over 20 per cent. The volatile matter content ranges from 23 to 27 per cent., and swelling numbers of 1 to 3½ were obtained. As the seam has a thickness of only 12 to 16 inches, it is of no economic importance.

On Welgevonden the seam attains a thickness of 8 inches. Here the ash content is 11.7 per cent., the volatile matter content 34.2 per cent., and the swelling number 2½.

## E. THE UPPER GUS OR GUS SEAM

This seam is absent in bore-hole 17, where all the coal-seams were destroyed by dolerite, and in bore-hole 18, which falls outside the coal-bearing area.

In the north-east, in bore-holes 26, 22 and 23, the seam is thin: the thickness ranges from 5 to 14½ inches.

It is also badly burnt in the last-mentioned bore-hole, and has a volatile matter content of 5.2 per cent.

The remaining bore-holes can be grouped into four separate areas according to the volatile matter content and coking properties.

(i) The Western high volatile area

This area includes bore-holes 20, 19, 27, 29, 30, 31 and 28.

Towards the south, near the outcrop, the overburden is thin and in bore-holes 27, 20 and 29 respectively it is only 24, 151 and 166 feet. It increases towards the north to a maximum value of 1,777 feet in bore-hole 28. The seam shows weathering in bore-hole 27, where it has a moisture content of 4.8 per cent.

In this area the seam is generally higher in moisture content than in the other areas: values of 2.1 to 4.8 per cent. have been obtained. The only exception is in bore-hole 28, where it has a moisture content of 1.2 per cent. This is also the only locality in this area where the seam has well developed swelling properties. A swelling number of 6½ was registered on floats at a specific gravity of 1.58. In all the other bore-holes swelling numbers on the floats at the same specific gravity ranged from 0 to 1½, but in bore-hole 20 values of 3 and 2 were obtained on the floats at a specific gravity of 1.40 and 1.50.

The seam is only 10 inches in bore-hole 31, but in the other bore-holes it is better developed. The thickness of the coal ranges from 23 to 54 inches. It is low in ash content, the maximum value of 17.8 per cent. being obtained in bore-hole 30, where it is also relatively free from partings. However, values as low as 6.3 per cent. were obtained. The volatile matter content is high: it ranges from 27.4 to 34.4 per cent.

Average values for the seam in bore-holes 20, 19, 27, 29, 30 and 28 are given below:

| | |
|---|---|
| Coal thickness | 37½ inches |
| Raw coal ash | 9.8 per cent. |

Floats of -1½ inches coal at 1.58 specific gravity:

| | |
|---|---|
| Yield | 94.1 per cent. |
| Calorific value | 13.2 lb./lb. |
| Moisture | 3.1 per cent. |
| Ash | 9.3 per cent. |
| Volatile matter | 29.5 per cent. |
| Fixed carbon | 58.1 per cent. |

### (ii) The Coking coal area

This area includes bore-holes 3, 9 and 24 on Klipplaatdrift 120 and bore-hole 8 on Uitzicht 113. The Gus Seam overburden ranges from 947 to 1,364 feet.

The volatile matter content of the seam in this area is also rather high: it ranges from 26 to 28 per cent. in all but bore-hole 8, where a value of 22.3 per cent. was obtained. The moisture content is low at 0.8 to 1.5 per cent., and the coal has well developed swelling properties, the swelling number on the floats at 1.50 specific gravity ranging from 3½ to 6½.

The upper portion of the seam in bore-hole 24 is inferior, but for the rest the seam is fairly low in ash content. On Klipplaatdrift 120 values of 12.8 to 17.9 per cent. were obtained over coal thicknesses of 31 to

47 inches.

In bore-hole 8 the seam is only 13 inches thick and too thin for mining.

In bore-holes 3, 9 and 24 - excluding the upper inferior coal in bore-hole 24 - it has the following average analyses:

| | |
|---|---|
| Coal thickness | 36½ inches |
| Raw coal ash | 15.5 per cent. |
| Floats of -1½ inches coal at 1.50 specific gravity: | |
| Yield | 77.0 per cent. |
| Calorific value | 13.4 lb./lb. |
| Moisture | 1.1 per cent. |
| Ash | 11.6 per cent. |
| Volatile matter | 28.1 per cent. |
| Fixed carbon | 59.2 per cent. |

The only disadvantage of the Gus Seam in this area is its great depth below the surface.

### (iii) The medium volatile areas surrounding the coking area

This area includes bore-holes 1 and 7 in the central portion of the prospected area, bore-holes 21 and 25 in the north-east, and bore-holes 15 and 16 in the south-east.

The Gus Seam is relatively thin in these bore-holes; bore-hole 16 is the only locality where it is over 3 feet. A minimum thickness of 21 inches was obtained in bore-hole 7.

The volatile matter content is generally lower than in the coking coal area. It is between 17.2 and 23.2 per cent. in all the bore-holes, except in 15, where a value of 12.6 per cent. was obtained; the seam is virtually non-coking.

Average values for the seam are as follows:

| | |
|---|---|
| Coal thickness | 29½ inches |
| Raw coal ash | 10.7 per cent. |
| Floats of -1½ inches coal at 1.50 specific gravity: | |
| Yield | 90.7 per cent. |
| Calorific value | 14.2 lb./lb. |
| Moisture | 1.3 per cent. |
| Ash | 8.7 per cent. |
| Volatile Matter | 19.4 per cent. |
| Fixed carbon | 70.6 per cent. |

The seam is of good quality, but its value is impaired by the fact that it is rather thin in certain areas and by its depth below the surface. This ranges from about 200 to 1,100 feet.

### (iv) The anthracitic area.

The Gus Seam is anthracitic in bore-holes 5, 6, 2 and 14, and the volatile matter content is between 7.5 and 7.8 per cent. It is also rather thin; the coal is 19 inches thick in bore-hole 5 and from 25½ to 32 inches in the other bore-holes. Average values for bore-holes 6, 2 and 14 are as follows:

| | |
|---|---|
| Coal thickness | 29 inches |
| Raw coal ash | 11.8 per cent. |
| Floats of -1½ inches coal at 1.50 specific gravity: | |
| Yield | 93.9 per cent. |
| Calorific Value | 14.0 lb./lb. |
| Moisture | 1.4 per cent. |
| Ash | 8.2 per cent. |
| Volatile matter | 7.6 per cent. |
| Fixed carbon | 82.8 per cent. |

## F. THE LOWER GUS SEAM

This seam is present only in one area in the east covered by bore-holes 23, 26, 9, 24, 3, 8 and 14. The seam is only 10 and 18 inches thick in bore-holes 14 and 23 and anthracitic in nature. In the other bore-holes the thickness of the seam ranges from 34 to 56 inches and the volatile matter content from 19.3 to 28.5 per cent. It possesses non- or slightly swelling properties and the maximum swelling number of 3 was obtained in bore-hole 9. Average values in bore-holes 26, 9, 24, 3 and 8 are as follows:

| | |
|---|---|
| Coal thickness | 40½ inches |
| Raw coal ash | 14.5 per cent. |
| Floats of -1½ inches coal at 1.50 specific gravity: | |
| Yield | 80.1 per cent. |
| Calorific value | 13.2 lb./lb. |
| Moisture | 1.7 per cent. |
| Ash | 11.5 per cent. |
| Volatile matter | 24.7 per cent. |
| Fixed carbon | 62.1 per cent. |

## G. THE DUNDAS SEAM

The Dundas Seam is not present in bore-holes 17 and 22, where it was destroyed by dolerite, and in bore-hole 18, where it was denuded. It was also not encountered in bore-holes 19, 20, 24 and 23, which were stopped above the Dundas Seam horizon.

In the western high volatile area covered by bore-holes 30, 31, 28, 27 and 29, the seam has a maximum coal thickness of only 12 inches, which is too thin for profitable mining. The seam is also thin in bore-holes 5 and 6 of the anthracitic area. In bore-hole 6 it is 14½ inches thick and in bore-hole 5 it consists of two bands of 13 and 7 inches separated by a 41-inch parting.

In the east a 13-inch shale band was encountered in bore-hole 16 at the Dundas Seam horizon and in bore-holes 15 and 21, where it consists of thin bands of coal up to 12 inches thick, separated by excessive partings, it is of no value.

The seam is better developed in (i) the coking coal area on Klipplaatdrift in bore-holes 26, 9 and 3, (ii) the medium volatile area in bore-holes 7, 8 and 1, and (iii) the anthracitic area in bore-holes 2 and 14. Here the following average values were obtained over the better portion of the seam:

| | (a) | (b) | (c) |
|---|---|---|---|
| Coal thickness considered ..... | 37 in. | 32 in. | 28 in. |
| Exclusions .................... | 1 in. | - | - |
| Raw Coal ash (per cent.) ....... | 15.6 | 15.2 | 14.0 |
| Floats of -1½ inches coal at 1.50 specific gravity: | | | |
| Yield (per cent.) ............. | 84.9 | 83.2 | 78.1 |
| Calorific value (lb./lb) ...... | 13.3 | 13.8 | 13.7 |
| Moisture (per cent.) .......... | 1.2 | 1.1 | 1.4 |
| Ash (per cent.) ............... | 12.1 | 11.2 | 11.2 |
| Volatile matter (per cent.) ... | 29.0 | 19.0 | 10.6 |
| Fixed carbon (per cent.) ...... | 57.7 | 68.7 | 76.8 |

(i) On Klipplaatdrift the seam is present in two sections in bore-holes 26 and 3. The lower section is only 9 inches thick and is separated from the upper section by 18 and 6 inches of sandstone or shale. The former is also rather inferior, the ash contents being 22 and 25 per cent.

For the rest the seam ranges in thickness from 30 to 41½ inches and has the fairly high volatile matter content of 27.4 to 30.0 per cent. In bore-holes 3 and 9 it has adequate swelling numbers of 5½ and 7 on floats at 1.50 specific gravity, but in bore-hole 26 the swelling power is but feebly developed; the swelling number being 2.

(ii) In bore-hole 7 the Dundas Seam occurs in two sections, but the lower section of 7 inches is too far removed from the main section of the seam to be of any value. For the rest, the coal thickness ranges from 27 to 40 inches and the volatile matter content from 16.1 to 21.6 per cent. The coal has no or only feebly developed swelling properties.

(iii) In the area where the coal is anthracitic the coal ranges in thickness from 22½ to 34 inches, the ash content from 12.1 to 16.8 per cent. and volatile matter content from 8.8 to 11.4 per cent. The seam is rather thin and inferior to anthracites that are being marketed at present.

The only other occurrence was encountered in borehole 25 in the north-east. Here the seam is also rather thin at 24 inches and contains coal of 16.8 per cent. ash and 20.4 per cent. volatile matter.

## H. SEAM "Z"

The seam was only encountered in bore-holes 25, 28 and 29. It is of no value, as it contains only from 4 to 10 inches of coal.

## I. THE COKING SEAM

This seam was destroyed by dolerite in bore-holes 1, 17, and 22 and bore-holes 19, 20, 9, 24 and 23 were stopped above the Coking Seam horizon.

It is generally thin: it is thicker than 2 feet in only four bore-holes. In bore-hole 31 on Jericho 189 in the west, 20½ inches out of a total thickness of 24 inches was recovered but the coal is inferior as the ash content is 24.9 per cent. In bore-hole 16 in the south-east the seam is also 24 inches thick and contains semi-anthracitic coal with a volatile matter content of 12.9 per cent. On Klipplaatdrift 120 the seam is 24 and 28 inches thick in bore-holes 26 and 3, and has a high volatile matter content (30.8 to 32.8 per cent.) and well developed swelling properties, giving swelling numbers of 5 and 8 on coal floated at 1.50 specific gravity. It has the fairly low ash content of about 11.5 per cent.

On the whole the seam is rather thin for mining, even at localities where it is best developed.

## J. THE TARGAS SEAM

A thin coal seam of 5 and 13 inches was encountered between the Gus and Dundas Seams in bore-holes 25 and 26.

This seam is too thin to be of any value.

## IV. - ULTIMATE AND OTHER ANALYSES

Area composite samples of various seams were made up for further analysis. The composition of these samples is given in Table 3.

Dry ash-free ultimate analyses (Table 4) indicate that the rank of the Gus Seam, as shown by its carbon content, is low in the western high volatile area, where a value of 82.1 per cent. was obtained. This is also confirmed by the high moisture content of the seam in this area.

The other carbon values range from 84.1 to 87.4 per cent., the lower values being associated with the higher hydrogen values.

The rank of the coal in the coking coal areas is generally higher than that of high volatile coking coals of the Newcastle area.

Hydrogen values range from 4.6 to 5.1 per cent., and are generally roughly proportional to the volatile matter content. The only exception to the above relationship is the rather low value of 4.8 per cent. obtained for the western high volatile and high moisture area.

Nitrogen values range from 2.2 to 2.4 per cent., which is fairly high, but this is a feature of Natal coals.

Ash fusion temperatures (Table 5) for the Gus Seam are generally low. The maximum value of 1,290°C. is associated with the medium volatile area east of Klipplaatdrift 120. Values as low as 1,170°C., however, were obtained. The Lower Gus and Coking Seams also registered the fairly low values of 1,270°C. to 1,280°C. Those for the Dundas Seam are more promising, being fairly low at 1,260°C. in bore-hole 14 only. On Klipplaatdrift and the surrounding areas ash-fusion temperatures of 1,340°C. and +1,400°C. were obtained.

As the sulphur content is an important property of coking coal, determinations were carried out on samples from all the major seams. Results of these determinations are given in Table 2.

In the coking coal area of Klipplaatdrift and Uitzicht, the Gus Seam is fairly high in sulphur, and values on the floats at 1.50 specific gravity range from 1.4 to 2.1 per cent. Values on the Dundas and Coking Seams were better: these range from 0.8 to 1.2 per cent.

## V. — THE BORE-HOLE RECORDS

BORE-HOLE 1 BOSCHHOEK 183 ELEVATION 5,566 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 10 | 0 | Soil and clay. | 10 | 0 |
| 2 | 0 | Dolerite boulders. | 12 | 0 |
| 140 | 4 | Shale, black. | 152 | 4 |
| 6 | 0 | Shale, sandy, black. | 158 | 4 |
| 2 | 9 | Sandstone, white, medium-grained. | 161 | 1 |
| 22 | 4 | Shale, black, with subordinate thin white sandstone bands. | 183 | 5 |
| 32 | 2 | Shale, sandy, black. | 215 | 7 |
| 3 | 6 | Sandstone, white, coarse- to fine-grained, with thin shale bands. | 219 | 1 |
| 3 | 11 | Sandstone, white, with shale bands. | 223 | 0 |
| 4 | 11 | Sandstone, shaly, dark grey. | 227 | 11 |
| | 1 | Shale, black, carbonaceous. | 228 | 0 |
| 5 | 0 | Sandstone, white, coarse- to fine-grained, with subordinate black shale bands. | 233 | 0 |
| 5 | 10 | Sandstone, grey, coarse-grained, with subordinate thin grey shale bands. | 238 | 10 |
| 55 | 0 | Sandstone, white, medium-grained. | 293 | 10 |
| 13 | 6 | Sandstone, grey, shaly, medium-grained, with subordinate black shale bands. | 307 | 4 |
| 19 | 9 | Shale, black, with subordinate white, laminated sandstone bands. | 327 | 1 |
| 7 | 4 | Sandstone, white, medium-grained, with subordinate black shale bands. | 334 | 5 |
| 2 | 5 | Sandstone, grey, with subordinate shale laminations. | 336 | 10 |
| 17 | 7 | Sandstone, white, fine- to coarse-grained, partly laminated, and black shale. | 354 | 5 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 13 | 7 | Sandstone, white, medium-grained. | 368 | 0 |
| 2 | 10 | Sandstone, white, medium-grained, with subordinate black shale bands. | 370 | 10 |
| 14 | 5 | Sandstone, white, medium-grained. | 385 | 3 |
| 42 | 1 | Sandstone, grey, fine-grained, with subordinate black shale bands. | 427 | 4 |
| 7 | 7 | Sandstone, white, fine- to coarse-grained, with black laminated shale. | 434 | 11 |
| | 5 | Coal, dull and bright. UPPER ELAND SEAM. | 435 | 4 |
| 2 | 4 | Sandstone, partly shaly, white, fine- to medium-grained. | 437 | 8 |
| 1 | 6 | Sandstone, coarse-grained, impregnated with oil. | 439 | 2 |
| 2 | 9 | Sandstone, white, medium-grained, with grey shale bands. | 441 | 11 |
| 3 | 4 | Sandstone, white, medium-grained. | 445 | 3 |
| | 0½ | Coal, bright. UPPER ELAND SEAM | 445 | 3½ |
| 7 | 2½ | Sandstone, laminated, white, medium-grained and grey shale. | 452 | 6 |
| 1 | 11 | Coal, mainly dull, bright at top and bottom. | 454 | 5 |
| 4 | 6 | Sandstone, laminated, white fine-grained, with grey shale bands. | 458 | 11 |
| | 5½ | Sandstone, carbonaceous, gritty. | 459 | 4½ |
| | 0½ | Coal, dull. LOWER ELAND SEAM. | 459 | 5 |
| 4 | 11 | Sandstone, laminated, white, medium-grained and black shale. | 464 | 4 |
| 3 | 2 | Sandstone, white, medium-grained. | 467 | 6 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In |
| 11 | 0 | Sandstone, white, coarse-grained, with subordinate black shale bands. | 478 | 6 |
| 6 | 8 | Sandstone, white, medium-grained, with subordinate black shale laminations. | 485 | 2 |
| 3 | 6 | Sandstone, white, medium- to coarse-grained, with subordinate laminated shaly sandstone. | 488 | 8 |
| 1 | 6 | Shale, black, with subordinate thin white sandstone bands. | 490 | 2 |
| | 10 | Sandstone, white, coarse- to medium-grained. | 491 | 0 |
| 8 | 4 | Shale, sandy, dark grey, 2 inches sandstone. | 499 | 4 |
| 1 | 8 | Sandstone, laminated, white, coarse-grained, and grey sandy shale. | 501 | 0 |
| 26 | 3 | Sandstone, shaly, fine-grained, with subordinate black shale bands. | 527 | 3 |
| 16 | 2 | Sandstone, grey, coarse- to medium-grained. | 543 | 5 |
| 7 | 10 | Shale, laminated, false-bedded, black, and coarse-grained white sandstone. | 551 | 3 |
| 2 | 8 | Sandstone, white, coarse-grained, with subordinate black shale laminations. | 553 | 11 |
| 1 | 6 | Shale, false-bedded, black and coarse-grained white sandstone. | 555 | 5 |
| 8 | 2 | Sandstone, white, coarse-grained. | 563 | 7 |
| 2 | 1 | Sandstone, white, fine-grained, and black shale. | 565 | 8 |
| 1 | 3 | Shale, black, with subordinate coarse-grained white sandstone bands. | 566 | 11 |
| 3 | 0 | Sandstone, white, medium-grained, with black shale bands. | 569 | 11 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 1 | 2 | Shale, black, with subordinate white sandstone bands. | 571 | 1 |
| 1 | 5 | Sandstone, white, medium-grained. | 572 | 6 |
| 6 | 6 | Shale, black, with subordinate white sandstone bands. | 579 | 0 |
| 6 | 8 | Shale, black and white gritty sandstone; at top ½ inch coal. | 585 | 8 |
| 3 | 4 | Shale, sandy, dark grey. | 589 | 0 |
| 13 | 8 | Sandstone, white, coarse-grained, gritty, with intercalated shale bands; at bottom 1½ inches black shale. | 602 | 8 |
| 2 | 3 | Coal, dull, mainly shaly; at top 11½ inches carbonaceous shale. ALFRED (MOSS) SEAM. | 604 | 11 |
| 1 | 2 | Shale, black. | 606 | 1 |
| 25 | 4 | Sandstone, white, coarse-grained, gritty. | 631 | 5 |
| 5 | 9 | Shale, black, with subordinate grey sandstone bands. | 637 | 2 |
| 22 | 10 | Sandstone, white, coarse-grained, gritty. | 660 | 0 |
| | 5½ | Coal, dull, shaly. RIDER SEAM. | 660 | 5½ |
| 2 | 10½ | Shale, black, with subordinate grey fine-grained sandstone bands. | 663 | 4 |
| 3 | 10 | Shale, sandy, grey and black shale. | 667 | 2 |
| 2 | 9 | Coal, mainly dull, mixed, bottom 16 inches bright coal. GUS SEAM. | 669 | 11 |
| | 5 | Shale, black. | 670 | 4 |
| 27 | 6 | Sandstone, white, coarse-grained, gritty. | 697 | 10 |
| | 1½ | Coal, mainly dull, with subordinate bright coal bands. | 697 | 11½ |
| 2 | 4 | Sandstone, laminated, grey, fine-grained and black, carbonaceous shale. | 700 | 3½ |
| | 1½ | Coal, mainly dull, mixed. | 700 | 5 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 1 | 1 | Sandstone, white, medium- to coarse-grained. | 701 | 6 |
| | 1 | Coal, mainly dull, mixed. | 701 | 7 |
| 20 | 3 | Sandstone, white, coarse-grained, gritty with intercalated thin black sandy shale. | 721 | 10 |
| 2 | 4 | Coal, mainly bright. DUNDAS (YARD) SEAM. | 724 | 2 |
| | 10 | Shale, sandy, black. | 725 | 0 |
| 3 | 7 | Sandstone, white, coarse-grained. | 728 | 7 |
| 3 | 6 | Shale, black, carbonaceous, and grey coarse-grained sandstone. DUNDAS (YARD) SEAM. | 732 | 1 |
| 3 | 11 | Sandstone, laminated, white fine-grained, and black shale. | 736 | 0 |
| 3 | 1½ | Sandstone, false-bedded, white, fine- to coarse-grained with subordinate black shale bands. | 739 | 1½ |
| | 0½ | Coal, bright. DUNDAS (YARD) SEAM. | 739 | 2 |
| 2 | 11 | Sandstone, grey, fine-grained, top 10 inches black shale. | 742 | 1 |
| 10 | 10 | Sandstone, white, coarse- to medium-grained, partly false-bedded, with black shale bands. | 752 | 11 |
| | 2 | Shale, black, carbonaceous. | 753 | 1 |
| 12 | 4 | Sandstone, white, medium-grained with subordinate black shale bands. | 765 | 5 |
| 118 | 1 | Dolerite. | 883 | 6 |
| | 3 | Sandstone, false-bedded, white, fine-grained. | 883 | 9 |
| 2 | 5 | Shale, black, carbonaceous (burnt). COKING SEAM. | 886 | 2 |
| 1 | 11 | Sandstone, false-bedded, dark. | 888 | 1 |
| 3 | 2 | Sandstone, white, fine- to medium-grained and black shale bands. | 891 | 3 |
| | 3 | Dolerite. | 891 | 6 |
| 8 | 4 | Sandstone, white, fine- to medium-grained and grey shale. | 899 | 10 |

B.H.1 (contd.)

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 12 | 7 | Sandstone, white, coarse- to medium-grained. | 912 | 5 |
| 2 | 5 | Dolerite. | 914 | 10 |
| 60 | 8 | Sandstone, white, medium-grained with subordinate laminated sandstone and shale bands. | 975 | 6 |

BORE-HOLE 2 NOYEESBOOM 68 ELEVATION 5,377 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 1 | 6 | Soil. | 1 | 6 |
| 12 | 5 | Dolerite, weathered. | 13 | 11 |
| 11 | 6 | Sandstone, white. | 25 | 5 |
| 3 | 2 | Dolerite. | 28 | 7 |
| 6 | 3 | Sandstone, white, fine-grained. | 34 | 10 |
| 1 | 11 | Shale, sandy, with sandstone bands. | 36 | 9 |
| 54 | 8 | Sandstone, white, fine- to medium-grained. | 91 | 5 |
| 14 | 2 | Shale, grey, with sandstone bands. | 105 | 7 |
| 21 | 0 | Sandstone, grey laminated, with subordinate thin coarse-grained bands. | 126 | 7 |
| 13 | 2 | Sandstone, grey and white. | 139 | 9 |
| 360 | 9 | Dolerite, (Zuinguin). | 500 | 6 |
| 13 | 5 | Sandstone, white, fine-grained. | 513 | 11 |
| 17 | 1 | Dolerite. | 531 | 0 |
| 10 | 0 | Sandstone, white, grey towards bottom, fine-grained. | 541 | 0 |
| 13 | 0 | Dolerite. | 554 | 0 |
| 30 | 3 | Sandstone, grey and white, fine-grained, and shaly bands. | 584 | 3 |
| 36 | 3 | Sandstone, white, fine- to medium-grained, with subordinate shaly bands. | 620 | 6 |
| 15 | 6 | Sandstone with white and grey thinly bedded, shaly sandstone. | 636 | 0 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 20 | 6 | Sandstone, white, medium- to coarse-grained, with subordinate grey black shaly bands. | 656 | 6 |
| 21 | 6 | Shale and sandstone, cross-bedded, thinly bedded. | 678 | 0 |
| 14 | 0 | Sandstone, dirty grey, fine-grained. | 692 | 0 |
| 13 | 6 | Sandstone and shale bands, wavy bedded. | 705 | 6 |
| 12 | 6 | Sandstone, dirty grey, coarse-grained. | 718 | 0 |
| 27 | 6 | Sandstone and shale, wavy bedded. | 745 | 6 |
| 12 | 11 | Sandstone, grey, coarse-grained to gritty. | 758 | 5 |
| 2 | 2 | Coal, dull, shaly. ALFRED (MOSS) SEAM. | 760 | 7 |
| 1 | 0 | Shale, sandy, black. | 761 | 7 |
| 54 | 0 | Sandstone, grey, coarse-grained to gritty. | 815 | 7 |
| | 4 | Sandstone, black. | 815 | 11 |
| | 1 | Coal. RIDER SEAM. | 816 | 0 |
| 1 | 8 | Sandstone, shaly, black. | 817 | 8 |
| 7 | 5 | Sandstone, dirty grey to white, fine- to medium-grained. | 825 | 1 |
| 1 | 7 | Shale, sandy, black. | 826 | 8 |
| 2 | 2 | Coal, mixed, at bottom carbonaceous shaly sandstone. GUS SEAM. | 828 | 10 |
| 1 | 0 | Sandstone and shale. | 829 | 10 |
| 52 | 2 | Sandstone, white, medium- to coarse-grained. | 882 | 0 |
| 3 | 0 | Coal, mixed, mainly bright, and carbonaceous shale. DUNDAS (YARD) SEAM. | 885 | 0 |
| 30 | 0 | Sandstone, dirty grey fine-grained, thinly bedded. | 915 | 0 |
| 2 | 2 | Sandstone, shaly, laminated, black. | 917 | 2 |
| 4 | 2 | Shale, carbonaceous. | 921 | 4 |
| 5 | 2 | Sandstone, dirty grey fine-grained. | 926 | 6 |
| 2 | 6 | Sandstone, white. | 929 | 0 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 1 | 1½ | Coal, mainly bright. COKING SEAM. | 930 | 1½ |
| 1 | 10½ | Sandstone, grey, laminated. | 932 | 0 |
| 16 | 7 | Shale, sandy, black laminated. | 948 | 7 |
| 66 | 5 | Sandstone, white, fine- to medium-grained. | 1015 | 0 |

BORE-HOLE 3 KLIPPLAATDRIFT 120 ELEVATION 5,760 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 5 | 0 | Soil and dolerite boulders. | 5 | 0 |
| 25 | 4 | Sandstone and shale, decomposed. | 30 | 4 |
| 290 | 9 | Dolerite. | 321 | 1 |
| 14 | 5 | Sandstone with a few shale bands. | 335 | 6 |
| 6 | 8 | Dolerite. | 342 | 2 |
| 2 | 11 | Sandstone. | 345 | 1 |
| 118 | 11 | Dolerite. | 464 | 0 |
| 7 | 8 | Sandstone. | 471 | 8 |
| 10 | 3 | Dolerite. | 481 | 11 |
| 14 | 11 | Sandstone, greyish to white, banded. | 496 | 10 |
| 51 | 9 | Sandstone, white, fine- to coarse-grained. | 548 | 7 |
| 4 | 2 | Sandstone, partly shaly, fine-grained, banded. | 552 | 9 |
| 4 | 2 | Dolerite. | 556 | 11 |
| 17 | 9 | Shale, sandy, with sandstone bands. | 574 | 8 |
| 2 | 2 | Sandstone with shale bands and lenses. | 576 | 10 |
| 2 | 2 | Shale, sandy, black, with sandstone bands. | 579 | 0 |
| 3 | 3 | Sandstone, fine-grained, bottom 9 inches gritty. | 582 | 3 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 15 | 1 | Sandstone, cross-bedded, with shaly bands in parts. | 597 | 4 |
| 28 | 6 | Sandstone, dirty white to grey, fine- to medium-grained. | 625 | 10 |
| 49 | 4 | Sandstone, white, medium- to coarse-grained, with a coal lens at bottom. | 675 | 2 |
| 22 | 7 | Sandstone, laminated, with wavy black layers; two 1/4 inch coaly bands at 684 ft. | 697 | 9 |
| 18 | 1 | Sandstone, white, medium-grained. | 715 | 10 |
| 1 | 0 | Sandstone, grey. | 716 | 10 |
| | 7 | Coal, bright. UPPER ELAND SEAM. | 717 | 5 |
| 14 | 9 | Sandstone, grey, wavy bedded, 1/4 inch coal at 728 ft. | 732 | 2 |
| 1 | 0 | Sandstone, dark grey. | 733 | 2 |
| | 11 | Coal, bright, with 1½ inches of carbonaceous shale 2 inches from top, and two half-an-inch shale bands at bottom. LOWER ELAND SEAM. | 734 | 1 |
| 2 | 9 | Sandstone, shaly, black, wavy banded. | 736 | 10 |
| | 2 | Coal, LOWER ELAND SEAM. | 737 | 0 |
| | 5 | Shale, black. | 737 | 5 |
| 12 | 11 | Sandstone, grey to dark grey, banded. | 750 | 4 |
| 6 | 10 | Sandstone, white, medium- to coarse-grained. | 757 | 2 |
| 3 | 10 | Sandstone, brownish grey, very fine-grained. | 761 | 0 |
| 3 | 7 | Sandstone, laminated. | 764 | 7 |
| 21 | 11 | Sandstone, shaly, black to grey, partly laminated. | 786 | 6 |
| 9 | 0 | Sandstone, dirty grey, coarse-grained. | 795 | 6 |
| 9 | 9 | Sandstone, shaly, black to white, wavy bedded. | 805 | 3 |
| 4 | 5 | Sandstone, grey. | 809 | 8 |
| 8 | 1 | Sandstone, grey-white. | 817 | 9 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 5 | 8 | Sandstone, black and grey. | 823 | 5 |
| 31 | 5 | Sandstone, shaly, black to grey. | 854 | 10 |
| | 3 | Shale, coaly. | 855 | 1 |
| 1 | 2 | Shale, carbonaceous. | 856 | 3 |
| 16 | 10 | Sandstone, white, coarse-grained to gritty. | 873 | 1 |
| | 3 | Sandstone, grey. | 873 | 4 |
| 2 | 2 | Coal, dull, with three half-an-inch shaly coal bands, two in middle and one near bottom. ALFRED (MOSS) SEAM. | 875 | 6 |
| 1 | 0 | Sandstone, black. | 876 | 6 |
| 22 | 5 | Sandstone, white, coarse-grained, gritty. | 898 | 11 |
| | 4 | Coal. RIDER SEAM. | 899 | 3 |
| 3 | 4 | Shale, sandy, black. | 902 | 7 |
| 44 | 10 | Sandstone, white, coarse-grained, gritty. | 947 | 5 |
| 2 | 7 | Coal, very bright. UPPER GUS (MAIN) SEAM. | 950 | 0 |
| 1 | 10 | Sandstone, grey. | 951 | 10 |
| 7 | 9 | Sandstone, white, coarse- to medium-grained. | 959 | 7 |
| 3 | 0 | Coal, mixed, mainly bright. LOWER GUS SEAM. | 962 | 7 |
| 2 | 4 | Sandstone, blackish, fine-grained. | 964 | 11 |
| 27 | 6½ | Sandstone, white grey, coarse-grained to gritty. | 992 | 5½ |
| 4 | 8½ | Coal, mainly bright. DUNDAS (YARD) SEAM. | 997 | 2 |
| 6 | 10 | Shale, sandy, black. | 1004 | 0 |
| 3 | 9 | Shale, sandy. | 1007 | 9 |
| 1 | 2 | Sandstone pellet conglomerate. | 1008 | 11 |
| 3 | 8 | Sandstone, grey and dark, wavy bedded. | 1012 | 7 |
| 5 | 1 | Sandstone, greyish, banded. | 1017 | 8 |
| 21 | 8 | Sandstone, white. | 1039 | 4 |
| | 10 | Shale, black, sandy. | 1040 | 2 |
| | 5 | Sandstone pellet conglomerate. | 1040 | 7 |
| | 4 | Sandstone, grey coarse-grained. | 1040 | 11 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 2 | 4 | Coal, bright, banded with 2 inches of dull coal 3 inches from top. COKING SEAM. | 1043 | 3 |
| 7 | 3 | Sandstone, shaly, grey and black. | 1050 | 6 |
| 7 | 10 | Sandstone, shaly. | 1058 | 4 |
| 3 | 10 | Shale, sandy, black, and shaly sandstone. | 1062 | 2 |
| 6 | 7 | Sandstone, white, with subordinate black shale bands. | 1068 | 9 |
| | 4 | Coal, bright. | 1069 | 1 |
| | 8 | Carbonaceous shale. | 1069 | 9 |
| | 2 | Shale, sandy. | 1069 | 11 |
| 18 | 9 | Sandstone, white, with subordinate black shaly sandstone bands. | 1088 | 8 |
| 2 | 1 | Sandstone, white. | 1090 | 9 |
| 20 | 7 | Sandstone, laminated, grey. | 1111 | 4 |

## BORE-HOLE 5 DAGERAAD 49 ELEVATION 5,764 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 11 | 0 | Soil and laterite. | 11 | 0 |
| 389 | 2 | Dolerite (Zuinguin). | 400 | 2 |
| 63 | 10 | Shale, indurated, with subordinate sandstone lenses and laminae. | 464 | 0 |
| 125 | 8 | Dolerite. | 589 | 8 |
| 8 | 0 | Sandstone, mainly grey, fine-grained, with few shaly laminae. | 597 | 8 |
| 35 | 7 | Sandstone, white to grey, fine- to medium-grained with occasional grey shale laminae. | 633 | 3 |
| 56 | 3 | Sandstone, white to grey, fine- to coarse-grained, and laminated black shale. | 689 | 6 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In |
| 12 | 3 | Sandstone, medium- to coarse-grained, with occasional black shale lenses. | 701 | 9 |
| 28 | 6 | Shale, laminated, black, and medium-grained, grey sandstone. | 730 | 3 |
| 6 | 7 | Sandstone, white, medium- to coarse-grained, and black shale. | 736 | 10 |
| 21 | 7 | Sandstone, white, fine-grained, with occasional black shale lenses, false-bedded. | 758 | 5 |
| 5 | 7 | Sandstone, white, at top 3 inches gritty, medium-grained. | 764 | 0 |
| 5 | 2 | Sandstone, grey, fine- to medium-grained, with occasional black shale lenses. | 769 | 2 |
| | 0½ | Shale, black, with a bright coal stringer. UPPER ELAND SEAM. | 769 | 2½ |
| 5 | 1½ | Sandstone, fine- to medium-grained, with occasional black shale lenses. | 774 | 4 |
| 2 | 7 | Sandstone, white, coarse-grained. | 776 | 11 |
| 7 | 2 | Shale, black, laminated, false-bedded, and fine-grained, grey sandstone. | 784 | 1 |
| 14 | 10 | Sandstone, white, coarse-grained. | 798 | 11 |
| 5 | 1 | Sandstone, white to grey, partly false-bedded, with intercalated black shale bands. | 804 | 0 |
| 14 | 11 | Sandstone, white, fine- to medium-grained. | 818 | 11 |
| | 2 | Coal, bright. LOWER ELAND SEAM | 819 | 1 |
| 1 | 4 | Shale, carbonaceous. | 820 | 5 |
| | 2 | Coal, bright. LOWER ELAND SEAM. | 820 | 7 |
| | 1 | Shale, black. | 820 | 8 |
| 1 | 0 | Sandstone, grey, cross-bedded. | 821 | 8 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 2 | 3½ | Shale, black, laminated, and grey to white, fine- to coarse-grained sandstone. | 823 | 11½ |
| | 0½ | Coal, shaly. | 824 | 0 |
| | 3½ | Sandstone, white, false-bedded, medium-grained. | 824 | 3½ |
| | 0½ | Coal, shaly. | 824 | 4 |
| | 10 | Shale, black, false-bedded. | 825 | 2 |
| | 1 | Coal, dull. | 825 | 3 |
| | 3 | Shale, sandy, black. | 825 | 6 |
| 10 | 6 | Sandstone, grey, fine-grained, with subordinate sandstone bands. | 836 | 0 |
| 29 | 6 | Sandstone, white, medium-grained. | 865 | 6 |
| 30 | 1 | Shale, sandy, black, laminated, and grey, fine-grained sandstone. | 895 | 7 |
| 14 | 8 | Shale, black, laminated, and fine-grained, grey sandstone with pyritic lenses. | 910 | 3 |
| 9 | 10 | Sandstone, white, medium-grained, gritty near the base. | 920 | 1 |
| 9 | 2 | Shale, black, laminated, and medium-grained, grey sandstone. | 929 | 3 |
| 2 | 1 | Sandstone, grey, fine-grained, with a few black shale laminae. | 931 | 4 |
| 4 | 7 | Shale, black, laminated, and medium-grained, grey sandstone. | 935 | 11 |
| | 5 | Coal, bright, at bottom 4½ inches carbonaceous shale. FRITZ SEAM. | 936 | 4 |
| 2 | 8 | Shale, sandy, and grey, fine-grained, laminated sandstone. | 939 | 0 |
| 23 | 8 | Sandstone, white, coarse-grained. | 962 | 8 |
| 4 | 2 | Sandstone, grey to white, fine- to medium-grained, with black sandy shale. | 966 | 10 |

B.H.5 (contd.)

| Thickness recovered | | Nature of strata | Ft. | In. |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 2 | 1 | Shale, carbonaceous. | 968 | 11 |
| | 8 | Coal, dull. ALFRED (MOSS) SEAM. | 969 | 7 |
| | 3 | Shale, carbonaceous, sandy. | 969 | 10 |
| 1 | 7 | Sandstone, shaly, black, partly carbonaceous. | 971 | 5 |
| 31 | 0 | Sandstone, white, coarse-grained, gritty. | 1002 | 5 |
| | 0½ | Coal, burnt. RIDER SEAM. | 1002 | 5½ |
| | 7½ | Dolerite. | 1003 | 1 |
| | 7 | Shale, sandy, black. | 1003 | 8 |
| 10 | 1 | Sandstone, medium- to fine-grained. | 1013 | 9 |
| 1 | 1 | Coal, mainly bright. GUS SEAM. | 1014 | 10 |
| | 6 | Sandstone, black, carbonaceous. | 1015 | 4 |
| 26 | 2 | Sandstone, white, coarse-grained, gritty. | 1041 | 6 |
| 1 | 8 | Shale, black. | 1043 | 2 |
| 19 | 2 | Sandstone, white, coarse-grained, gritty. | 1062 | 4 |
| 1 | 1 | Coal, bright, banded DUNDAS (YARD) SEAM. | 1063 | 5 |
| | 3 | Shale, black. | 1063 | 8 |
| | 5 | Sandstone, grey, medium-grained. | 1064 | 1 |
| 1 | 2 | Shale, carbonaceous. | 1065 | 3 |
| | 1 | Sandstone, grey, medium-grained. | 1065 | 4 |
| | 4 | Shale, carbonaceous. | 1065 | 8 |
| 1 | 1 | Sandstone, laminated, white, medium-grained, and fine-grained shaly sandstone | 1066 | 9 |
| | 7 | Coal, bright. DUNDAS (YARD) SEAM. | 1067 | 4 |
| 1 | 0 | Shale, black, slightly carbonaceous. | 1068 | 4 |
| 1 | 8 | Sandstone, laminated, grey, fine-grained, and black shale. | 1070 | 0 |
| 4 | 3 | Sandstone, white, coarse-grained, gritty. | 1074 | 3 |
| | 4 | Shale, black. | 1074 | 7 |
| 40 | 7 | Sandstone, white, coarse-grained, gritty, with subordinate black, coaly shale. | 1115 | 2 |
| | 2 | Shale, black. | 1115 | 4 |
| | 8 | Coal, bright, banded. COKING SEAM. | 1116 | 0 |
| 4 | 5 | Sandstone, laminated, grey, fine-grained, and black shale. | 1120 | 5 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 3 | 3 | Shale, black. | 1123 | 8 |

BORE-HOLE 6 POLITIEK 67 ELEVATION 5,359 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 2 | 0 | Soil. | 2 | 0 |
| 3 | 0 | Boulders. | 5 | 0 |
| 168 | 4 | Dolerite (Zuinguin). | 173 | 4 |
| 25 | 0 | Sandstone, partly shaly, grey, fine-grained. | 198 | 4 |
| 51 | 6 | Sandstone, greyish white, fine-grained. | 249 | 10 |
| 106 | 2 | Dolerite (Zuinguin). | 356 | 0 |
| 16 | 0 | Sandstone, white, fine-grained. | 372 | 0 |
| 4 | 9 | Sandstone, grey, coarse-grained. | 376 | 9 |
| 60 | 9 | Sandstone, grey to white, fine- to medium-grained. | 437 | 6 |
| 3 | 6 | Shale, sandy, black, and shaly sandstone. | 441 | 0 |
| 13 | 0 | Sandstone, grey, fine-grained. | 454 | 0 |
| 25 | 5 | Sandstone, grey, wavy bedded. | 479 | 5 |
| 25 | 7 | Sandstone, grey, fine- to medium-grained. | 505 | 0 |
| 3 | 5 | Sandstone, white, coarse-grained. | 508 | 5 |
| 41 | 10 | Sandstone, grey, fine-grained, laminated. | 550 | 3 |
| 1 | 0 | Sandstone, shaly, black. | 551 | 3 |
| 21 | 3 | Sandstone, white, coarse-grained. | 572 | 6 |
| 8 | 6 | Sandstone, grey, fine-grained. | 581 | 0 |
| 2 | 7 | Sandstone, grey and black, laminated, and subordinate black shale. | 583 | 7 |
| | 2 | Coal, bright. ELAND SEAM. | 583 | 9 |
| 1 | 7 | Shale, black. | 585 | 4 |
| | 0½ | Coal, ELAND SEAM. | 585 | 4½ |
| 4 | 3½ | Sandstone, black and white, banded. | 589 | 8 |
| 5 | 8 | Sandstone and black sandy shale, with coal stringers near top and bottom. | 595 | 4 |
| 8 | 0 | Sandstone, cross-bedded. | 603 | 4 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 14 | 8 | Sandstone, white, medium-grained, banded. | 618 | 0 |
| 4 | 10 | Sandstone, black. | 622 | 10 |
| 25 | 9 | Sandstone, and black, sandy shale bands, cross-bedded. | 648 | 7 |
| 7 | 6 | Sandstone, grey, fine-grained, partly gritty. | 656 | 1 |
| 26 | 4 | Sandstone, cross-bedded and black, shaly sandstone bands. | 682 | 5 |
| 3 | 0 | Sandstone, white, coarse-grained. | 685 | 5 |
| 5 | 10 | Sandstone, cross-bedded and black, shaly sandstone bands. | 691 | 3 |
| 10 | 8 | Sandstone, whitish, fine-grained, with subordinate shaly sandstone bands. | 701 | 11 |
| | 2 | Coal, bright. FRITZ SEAM. | 702 | 1 |
| | 7 | Shale, black. | 702 | 8 |
| | 2 | Coal, shaly. FRITZ SEAM. | 702 | 10 |
| | 8 | Shale, black. | 703 | 6 |
| 19 | 4 | Sandstone, white, coarse-grained, gritty towards bottom. | 722 | 10 |
| 6 | 0 | Sandstone, shaly, black, and grey sandstone. | 728 | 10 |
| 5 | 11 | Sandstone, white, medium-grained. | 734 | 9 |
| 22 | 6 | Dolerite. | 757 | 3 |
| 45 | 0 | Sandstone, white and grey, coarse-grained to gritty. | 802 | 3 |
| | 6 | Shale and coaly shale. | 802 | 9 |
| 2 | 3 | Coal, mixed, mainly dull, brighter in bottom 7 inches. GUS SEAM. | 805 | 0 |
| | 8 | Shale, black, sandy. | 805 | 8 |
| 1 | 6 | Sandstone, grey. | 807 | 2 |
| 43 | 10 | Sandstone, white, felspathic, coarse-grained, with a few gritty sandstone bands. | 851 | 0 |
| 1 | 2½ | Coal, bright. DUNDAS (YARD) SEAM. | 852 | 2½ |
| | 0½ | Shale. | 852 | 3 |
| 1 | 2 | Shale, sandy, black, with 3 inches coal and shale in middle. | 853 | 5 |
| 65 | 3 | Sandstone, white, coarse-grained, partly gritty. | 918 | 8 |
| | 1½ | Coal. COKING SEAM. | 918 | 9½ |
| | 10½ | Sandstone, grey. | 919 | 8 |

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| | 11 | Coal, bright, banded. COKING SEAM. | 920 | 7 |
| 14 | 2 | Sandstone, shaly, black. | 934 | 9 |
| 14 | 11 | Sandstone, white, felspathic. | 949 | 8 |

BORE-HOLE 7 WELGEVONDEN 50 ELEVATION 5,648 FT.

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 25 | 6 | Soil. | 25 | 6 |
| 2 | 0 | Shale. | 27 | 6 |
| 6 | 4 | Sandstone, fine-grained, and shale bands. | 33 | 10 |
| 338 | 1 | Dolerite. | 371 | 11 |
| 2 | 7 | Sandstone, fine-grained. | 374 | 6 |
| 28 | 10 | Dolerite. | 403 | 4 |
| 3 | 6 | Shale, sandy, fine-grained. | 406 | 10 |
| 5 | 5 | Shale, grey, and white, fine- to medium-grained sandstone. | 412 | 3 |
| | 1 | Shale, black. | 412 | 4 |
| 5 | 1 | Sandstone, white, fine- to medium-grained. | 417 | 5 |
| 31 | 3 | Dolerite. | 448 | 8 |
| 8 | 9 | Sandstone, white, fine-grained, with occasional thin shale bands. | 457 | 5 |
| 8 | 8 | Shale, dark blue. | 466 | 1 |
| 1 | 2 | Shale, black, and white, medium-grained sandstone. | 467 | 3 |
| 2 | 0 | Sandstone, white, coarse-grained, with subordinate shale bands. | 469 | 3 |
| 49 | 4 | Sandstone, white, coarse- to medium-grained, with subordinate black shale. | 518 | 7 |
| 3 | 4 | Sandstone, grey, coarse-grained, partly gritty, false-bedded. | 521 | 11 |
| 11 | 10 | Sandstone, white, medium-grained, and black shale. | 533 | 9 |
| | 5 | Shale, black. | 534 | 2 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 19 | 8 | Sandstone, white, medium-grained, with subordinate black laminated shale. | 553 | 10 |
| | 4 | Shale, grey, pyritic. | 554 | 2 |
| 26 | 2 | Sandstone, grey, fine-grained, with subordinate black, laminated shale. | 580 | 4 |
| 4 | 1 | Sandstone, grey, medium-grained. | 584 | 5 |
| 6 | 8 | Sandstone, laminated, and shale. | 591 | 1 |
| 6 | 8 | Sandstone, grey, medium- to fine-grained, with intercalated shale bands. | 597 | 9 |
| 16 | 1 | Sandstone, white, fine- to medium-grained, false-bedded, with subordinate laminated shale. | 613 | 10 |
| 4 | 4 | Shale, black, with subordinate sandstone laminae. | 618 | 2 |
| | 3½ | Sandstone, gritty. | 618 | 5½ |
| | 0½ | Coal, bright. UPPER ELAND SEAM. | 618 | 6 |
| | 2 | Shale, carbonaceous. | 618 | 8 |
| | 1 | Coal, bright, with shale laminae. UPPER ELAND SEAM. | 618 | 9 |
| 13 | 11 | Sandstone, grey, fine- to medium-grained, with subordinate black shale laminae. | 632 | 8 |
| | 2½ | Coal, bright. LOWER ELAND SEAM. | 632 | 10½ |
| 1 | 4 | Shale, carbonaceous. | 634 | 2½ |
| | 0½ | Coal, dull. LOWER ELAND SEAM. | 634 | 3 |
| | 3 | Shale, black, partly carbonaceous. | 634 | 6 |
| 6 | 3 | Sandstone, white, coarse- to fine-grained, and black shale laminae. | 640 | 9 |
| 5 | 3 | Shale, black, with subordinate white, medium-grained sandstone bands. | 646 | 0 |
| 9 | 9 | Sandstone, white, coarse- to medium-grained, with subordinate black shale bands. | 655 | 9 |
| 1 | 8 | Shale, black, with subordinate fine-grained sandstone bands. | 657 | 5 |
| 8 | 4 | Sandstone, white, fine-grained, with subordinate black shale laminations. | 665 | 9 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 1 | 1 | Shale, sandy, grey. | 666 | 10 |
| 12 | 8 | Sandstone, with subordinate black shale laminations. | 679 | 6 |
| 6 | 3 | Sandstone, fine-grained, and black shale. | 685 | 9 |
| 15 | 9 | Shale, black, with subordinate grey sandstone. | 701 | 6 |
| 4 | 1 | Sandstone, grey, fine-grained, with subordinate black shale laminae. | 705 | 7 |
| 14 | 6 | Shale, black, with subordinate grey sandstone laminae. | 720 | 1 |
| 3 | 2 | Sandstone, white, coarse-grained. | 723 | 3 |
| | 7 | Shale, black. | 723 | 10 |
| 7 | 6 | Sandstone, white, coarse-grained. | 731 | 4 |
| 6 | 6 | Shale, black, with subordinate white sandstone bands. | 737 | 10 |
| 6 | 10 | Sandstone, coarse- to fine-grained, with black shale laminae. | 744 | 8 |
| | 2 | Shale, carbonaceous. | 744 | 10 |
| | 0½ | Coal, dull, FRITZ SEAM. | 744 | 10½ |
| 1 | 4½ | Shale, carbonaceous. | 746 | 3 |
| 24 | 1 | Sandstone, white, coarse-grained and shale bands. | 770 | 4 |
| 3 | 1 | Shale, black, and white sandstone. | 773 | 5 |
| | 7 | Shale, carbonaceous. | 774 | 0 |
| 1 | 5½ | Coal, dull, and carbonaceous shale. ALFRED (MOSS) SEAM. | 775 | 5½ |
| 1 | 2½ | Shale, carbonaceous. | 776 | 8 |
| 1 | 3 | Sandstone, laminated, carbonaceous, and shale. | 777 | 11 |
| 48 | 10 | Sandstone, white, coarse- to fine-grained, at bottom 2 inches carbonaceous sandstone. | 826 | 9 |
| 1 | 9 | Coal, mixed, mainly dull. GUS SEAM. | 828 | 6 |
| | 10 | Sandstone, carbonaceous. | 829 | 4 |
| 7 | 10 | Sandstone, white, medium-grained, and grey, sandy shale. | 837 | 2 |
| 8 | 5 | Sandstone, white, coarse-grained. | 845 | 7 |
| 12 | 11 | Sandstone, white, gritty. | 858 | 6 |
| | 2 | Coal, dull, shaly. | 858 | 8 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 9 | 3 | Sandstone, white, fine-grained, and black shale. | 867 | 11 |
| 11 | 11 | Sandstone, white, coarse-grained, with subordinate shale laminations. | 879 | 10 |
| 2 | 3 | Coal, mixed, mainly bright. DUNDAS (YARD) SEAM. | 882 | 1 |
| 2 | 6 | Sandstone, fine-grained and shale. | 884 | 7 |
| | 7 | Coal, mixed, mainly dull, DUNDAS (YARD) SEAM. | 885 | 2 |
| 58 | 10 | Sandstone, white, coarse-grained. | 944 | 0 |
| 1 | 6 | Coal, mainly bright. COKING SEAM. | 945 | 6 |

## BORE-HOLE 8 UITZICHT 113 ELEVATION 5,895 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 1 | 0 | Soil | 1 | 0 |
| 61 | 2 | Shale, weathered. | 62 | 2 |
| 2 | 2 | Dolerite. | 64 | 4 |
| 13 | 4 | Shale, grey, indurated. | 77 | 8 |
| 3 | 0 | Sandstone, indurated. | 80 | 8 |
| 267 | 11 | Dolerite (Zuinguin). | 348 | 7 |
| 13 | 8 | Shale, indurated. | 362 | 3 |
| 144 | 8 | Dolerite (Zuinguin). | 506 | 11 |
| 1 | 6 | Sandstone, indurated. | 508 | 5 |
| 12 | 2 | Shale, sandy, grey. | 520 | 7 |
| 5 | 0 | Dolerite. | 525 | 7 |
| 38 | 7 | Shale, sandy, grey, wavy bedded. | 564 | 2 |
| 5 | 3 | Sandstone, shaly, black. | 569 | 5 |
| 2 | 9 | Sandstone, dirty grey, coarse-grained. | 572 | 2 |
| 8 | 0 | Sandstone, grey, fine-grained. | 580 | 2 |
| 24 | 1 | Sandstone, white, fine- to medium-grained, partly banded. | 604 | 3 |
| 77 | 6 | Dolerite (Zuinguin). | 681 | 9 |
| 30 | 3 | Sandstone, white, indurated, coarse-grained, partly gritty. | 712 | 0 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 2 | 9 | Sandstone, grey, fine-grained, with irregular carbonaceous streaks and lenses. | 714 | 9 |
| 15 | 4 | Sandstone, whitish grey, fine-grained. | 730 | 1 |
| 26 | 11 | Sandstone, shaly, black, cross-bedded. | 757 | 0 |
| 19 | 0 | Sandstone, grey, cross-bedded. | 776 | 0 |
| 30 | 0 | Sandstone, white, medium-grained. | 806 | 0 |
| 2 | 0 | Sandstone, grey. | 808 | 0 |
| 4 | 3 | Dolerite. | 812 | 3 |
| 34 | 9 | Sandstone, white, medium- to coarse-grained. | 847 | 0 |
| 1 | 10 | Dolerite. | 848 | 10 |
| 15 | 2 | Sandstone, white, coarse-grained. | 864 | 0 |
| 22 | 8 | Dolerite, porphyritic. | 886 | 8 |
| 7 | 8 | Sandstone, grey-white. | 894 | 4 |
| 3 | 0 | Shale. | 897 | 4 |
| 214 | 11 | Dolerite. | 1112 | 3 |
| 8 | 3 | Sandstone, laminated, indurated. | 1120 | 6 |
| 23 | 0 | Sandstone, white, fine-grained, laminated at top and bottom. | 1143 | 6 |
| 8 | 2 | Sandstone, grey to white, laminated. | 1151 | 8 |
| | 1 | Shale, carbonaceous. | 1151 | 9 |
| | 3 | Coal, bright. ELAND SEAM. | 1152 | 0 |
| 3 | 9 | Sandstone, grey and black, cross-bedded. | 1155 | 9 |
| 6 | 1 | Sandstone, grey and black, fine-grained. | 1161 | 10 |
| 3 | 0 | Sandstone, white and black. | 1164 | 10 |
| 30 | 5 | Sandstone, white, medium- to coarse-grained, partly gritty, black, shaly bands over 6 to 9 inches. | 1195 | 3 |
| 43 | 10 | Sandstone, shaly, grey and black. | 1239 | 1 |
| 8 | 10 | Shale, sandy, black, with sandstone laminae. | 1247 | 11 |
| 4 | 4 | Sandstone, shaly. | 1252 | 3 |
| 3 | 7 | Sandstone, white coarse-grained. | 1255 | 10 |

| Thickness recovered |  | Nature of strata | True depth |  |
|---|---|---|---|---|
| Ft. | In. |  | Ft. | In. |
| 4 | 10 | Sandstone, grey, and black, sandy shale. | 1260 | 8 |
| 14 | 5 | Sandstone, shaly, grey to black, laminated, wavy bedded. | 1275 | 1 |
|  | 11 | Coal, bright, partly shaly, carbonaceous, FRITZ SEAM. | 1276 | 0 |
|  | 9 | Shale, sandy, black. | 1276 | 9 |
| 1 | 2 | Sandstone, grey to black. | 1277 | 11 |
| 20 | 6 | Sandstone, white, coarse-grained to gritty. | 1298 | 5 |
|  | 9 | Coal, mixed, shaly. ALFRED (MOSS) SEAM. | 1299 | 2 |
| 2 | 8 | Shale, sandy, black. | 1301 | 10 |
| 3 | 9 | Sandstone, grey to black, indurated. | 1305 | 7 |
| 2 | 1 | Sandstone, greyish, fine-grained. | 1307 | 8 |
| 10 | 9 | Sandstone, white, coarse-grained to gritty. | 1318 | 5 |
|  | 3 | Coal, RIDER SEAM. | 1318 | 8 |
| 2 | 6 | Shale, sandy black. | 1321 | 2 |
| 3 | 11 | Sandstone, whitish, coarse-grained. | 1325 | 1 |
|  | 3 | Sandstone, grey. | 1325 | 4 |
|  | 3 | Coal, RIDER SEAM. | 1325 | 7 |
| 1 | 9 | Shale, sandy, black, with shaly sandstone. | 1327 | 4 |
| 36 | 3 | Sandstone, white, coarse-grained to gritty. | 1363 | 7 |
| 1 | 1 | Coal, bright. UPPER GUS (MAIN) SEAM. | 1364 | 8 |
|  | 3 | Shale, sandy, black. | 1364 | 11 |
|  | 10 | Sandstone, shaly. | 1365 | 9 |
|  | 3 | Sandstone, grey. | 1366 | 0 |
| 19 | 9 | Sandstone, white, grey towards top, coarse-grained to gritty. | 1385 | 9 |
| 2 | 10 | Coal, mixed, mainly bright, LOWER GUS SEAM. | 1388 | 7 |
| 3 | 10 | Sandstone, laminated, grey to black. | 1392 | 5 |
| 18 | 11 | Sandstone, grey, fine-grained to gritty. | 1411 | 4 |

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 2 | 5 | Coal, bright with a ¼-inch shale band 10 inches from bottom and a ¾-inch shale band 7 inches from bottom. DUNDAS (YARD) SEAM. | 1413 | 9 |
| 1 | 0 | Shale, sandy, black. | 1414 | 9 |
|  | 1 | Coal, DUNDAS (YARD) SEAM. | 1414 | 10 |
|  | 3 | Shale, sandy, black. | 1415 | 1 |
| 1 | 0 | Sandstone, greyish. | 1416 | 1 |
| 42 | 9 | Sandstone, grey to white, coarse-grained.to gritty. | 1458 | 10 |
| 15 | 4 | Sandstone, grey, coarse-grained to gritty, with occasional bands of black shale. | 1474 | 2 |
| 1 | 3 | Coal, bright. COKING SEAM. | 1475 | 5 |
| 25 | 2 | Sandstone, grey, medium-grained, with black shale bands. | 1500 | 7 |

### BORE-HOLE 9 KLIPPLAATDRIFT 120 ELEVATION 5,828 FT.

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 9 | 0 | Soil and clay. | 9 | 0 |
| 2 | 0 | Sandstone, yellow, weathered. | 11 | 0 |
| 6 | 0 | Sandstone, shaly, and sandy shale. | 17 | 0 |
| 302 | 6 | Shale, black. | 319 | 6 |
| 29 | 2 | Dolerite. | 348 | 8 |
| 75 | 7 | Shale, black, sandy. | 424 | 3 |
| 10 | 3 | Shale, indurated, and sandstone. | 434 | 6 |
| 103 | 2 | Dolerite. | 537 | 8 |
| 19 | 3 | Shale, sandy, 10 inches sandstone at top. | 556 | 11 |
| 25 | 1 | Sandstone, grey, shaly, fine-grained. | 582 | 0 |
| 1 | 4 | Sandstone, calcareous. | 583 | 4 |
| 14 | 10 | Sandstone, grey, shaly, fine-grained. | 598 | 2 |
| 37 | 5 | Dolerite. | 635 | 7 |
| 2 | 8 | Sandstone, quartzitic. | 638 | 3 |
| 94 | 4 | Dolerite. | 732 | 7 |
| 9 | 5 | Sandstone, felspathic, fine- to coarse-grained, with subordinate shaly sandstone bands. | 742 | 0 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 8 | 0 | Sandstone, shaly, fine-grained, grey. | 750 | 0 |
| 15 | 9 | Sandstone, grey, white, partly shaly, fine- to medium-grained. | 765 | 9 |
| 75 | 2 | Sandstone, white, medium- to coarse-grained, partly gritty. | 840 | 11 |
| 15 | 2 | Shale, sandy, black, and grey cross-bedded sandstone bands. | 856 | 1 |
| 14 | 11 | Sandstone, grey, fine- to medium-grained, with black, irregular streaks. | 871 | 0 |
| 17 | 0 | Shale, banded, sandy, black, and grey, cross-bedded sandstone bands. | 888 | 0 |
| 51 | 11 | Sandstone, white, fine-grained, with black, irregular streaks. | 939 | 11 |
| 2 | 9 | Dolerite. | 942 | 8 |
| 29 | 6 | Sandstone, white, medium- to coarse-grained, partly gritty. | 972 | 2 |
| 16 | 10 | Shale, sandy, black, cross-bedded, and grey, fine-grained, shaly sandstone, unevenly bedded. | 989 | 0 |
| 16 | 11 | Sandstone, white, medium-grained, partly gritty. | 1005 | 11 |
| | 4 | Coal, bright. UPPER ELAND SEAM. | 1006 | 3 |
| 17 | 11 | Sandstone, grey. | 1024 | 2 |
| | 5 | Shale, carbonaceous. | 1024 | 7 |
| | 3 | Coal, and sandstone. LOWER ELAND SEAM. | 1024 | 10 |
| 2 | 6 | Shale, banded, sandy, black, and grey, cross-bedded sandstone bands. | 1027 | 4 |
| | 2 | Coal. LOWER ELAND SEAM. | 1027 | 6 |
| 1 | 4 | Sandstone, grey. | 1028 | 10 |
| 18 | 3 | Sandstone, white, medium-grained. | 1047 | 1 |
| 13 | 0 | Sandstone, laminated, grey, partly cross-bedded. | 1060 | 1 |
| 15 | 0 | Shale, banded, sandy, black, and grey, fine-grained, cross-bedded sandstone bands. | 1075 | 1 |

| Thickness recovered |  | Nature of strata | True depth |  |
|---|---|---|---|---|
| Ft. | In. |  | Ft. | In. |
| 6 | 7 | Sandstone, grey, medium-grained. | 1081 | 8 |
| 28 | 2 | Shale, sandy, black, and grey, fine-grained sandstone bands. | 1109 | 10 |
| 14 | 0 | Sandstone, partly shaly, grey, fine-grained, and sandy shale bands. | 1123 | 10 |
| 14 | 1 | Shale, sandy, black, and grey, fine-grained sandstone bands. | 1137 | 11 |
|  | 1 | Coal. FRITZ SEAM. | 1138 | 0 |
| 1 | 2 | Sandstone and shale. | 1139 | 2 |
| 13 | 5 | Sandstone, grey, coarse-grained to gritty. | 1152 | 7 |
| 3 | 0 | Coal, mainly dull, partly bright, with shale bands. ALFRED (MOSS) SEAM. | 1155 | 7 |
|  | 2 | Shale, carbonaceous. | 1155 | 9 |
| 1 | 5 | Sandstone, shaly. | 1157 | 2 |
| 20 | 11 | Sandstone, grey-white, coarse-grained to gritty. | 1178 | 1 |
| 1 | 4 | Coal, mainly bright. RIDER SEAM. | 1179 | 5 |
| 1 | 10 | Shale and sandstone. | 1181 | 3 |
| 27 | 2 | Sandstone, white, coarse-grained. | 1208 | 5 |
|  | 8 | Shale, black. | 1209 | 1 |
|  | 6 | Coal, and shale. UPPER GUS (MAIN) SEAM. | 1209 | 7 |
| 2 | 1 | Sandstone, grey-white, fine-grained. | 1211 | 8 |
|  | 2 | Coal. UPPER GUS (MAIN) SEAM. | 1211 | 10 |
|  | 9 | Sandstone, grey-white. | 1212 | 7 |
| 3 | 11 | Coal, mainly bright. UPPER GUS (MAIN) SEAM. | 1216 | 6 |
|  | 3 | Shale, sandy. | 1216 | 9 |
| 11 | 11 | Sandstone, grey to white, coarse-grained. | 1228 | 8 |
| 3 | 0 | Coal, mainly bright. LOWER GUS SEAM. | 1231 | 8 |
| 2 | 10 | Sandstone, grey-black, bedded. | 1234 | 6 |
| 21 | 8 | Sandstone, grey, coarse-grained to gritty. | 1256 | 2 |
| 3 | 6 | Coal, bright, partly shaly. DUNDAS (YARD) SEAM. | 1259 | 8 |
|  | 4 | Shale, carbonaceous, coaly. | 1260 | 0 |
|  | 5 | Shale, black. | 1260 | 5 |
| 4 | 0 | Sandstone, banded in parts, grey-white, medium-grained. | 1264 | 5 |

## BORE-HOLE 14 GAATWEEL 118 ELEVATION 5,411 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 2 | 0 | Soil. | 2 | 0 |
| 13 | 2 | Sandstone, weathered. | 15 | 2 |
| 5 | 9 | Sandstone, coarse-grained. | 20 | 11 |
| 19 | 2 | Sandstone, white, mainly fine-grained, partly gritty, with a few shale bands. | 40 | 1 |
| | 6 | Coal, mixed. ELAND SEAM. | 40 | 7 |
| | 4 | Shale, sandy, black. | 40 | 11 |
| 14 | 3 | Sandstone, white, fine-grained, with subordinate black shale bands. | 55 | 2 |
| 3 | 5 | Shale, black and grey, slightly carbonaceous sandstone. | 58 | 7 |
| 21 | 7 | Sandstone, white, medium-grained. | 80 | 2 |
| 30 | 4 | Shale, black, and grey sandstone. | 110 | 6 |
| 8 | 2 | Sandstone, grey, coarse-grained. | 118 | 8 |
| 23 | 10 | Shale, black, and grey sandstone. | 142 | 6 |
| 11 | 8 | Sandstone, white, medium-grained. | 154 | 2 |
| 13 | 6 | Shale, black, and grey, cross-bedded sandstone. | 167 | 8 |
| 1 | 0 | Sandstone, white, fine-grained. | 168 | 8 |
| | 11 | Sandstone, carbonaceous. | 169 | 7 |
| 15 | 10 | Sandstone, medium- to coarse-grained, white, partly gritty. | 185 | 5 |
| 2 | 3 | Coal, dull, shaly, pyritic. ALFRED (MOSS) SEAM. | 187 | 8 |
| 75 | 11 | Sandstone, white, medium- to coarse-grained, partly gritty. | 263 | 7 |
| 1 | 10 | Shale, black, slightly cross-bedded. | 265 | 5 |
| 2 | 7 | Coal, bright. UPPER GUS (MAIN) SEAM. | 268 | 0 |
| | 2 | Shale, carbonaceous. | 268 | 2 |
| 30 | 5 | Sandstone, white, coarse-grained, and black shale. | 298 | 7 |
| | 10 | Coal, mainly bright. LOWER GUS SEAM. | 299 | 5 |
| 5 | 8 | Sandstone, white, fine-grained. | 305 | 1 |
| 7 | 3 | Sandstone, grey, coarse-grained. | 312 | 4 |
| 2 | 10 | Coal, bright. DUNDAS (YARD) SEAM. | 315 | 2 |
| 1 | 9 | Shale, black, carbonaceous, and carbonaceous sandstone. | 316 | 11 |
| 6 | 8 | Sandstone, grey, fine-grained, and black, sandy shale. | 323 | 7 |
| 2 | 2 | Shale, black, with grey sandstone bands near base. | 325 | 9 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 44 | 3 | Sandstone, white, fine- to coarse-grained, 2 inches black shale at bottom. | 370 | 0 |
| 6 | 0 | Sandstone, white, fine-grained, slightly cross-bedded. | 376 | 0 |
| 1 | 5 | Coal, mainly bright. COKING SEAM. | 377 | 5 |
| 19 | 3 | Shale, black, and grey, partly gritty sandstone. | 396 | 8 |
| 87 | 11 | Sandstone, grey, fine- to medium-grained, with black shale bands. | 484 | 7 |
| 14 | 5 | Sandstone, grey, fine-grained, cross-bedded, and black shale lenses. | 499 | 0 |
| 7 | 6 | Shale, black. | 506 | 6 |
| 4 | 5 | Sandstone, grey, medium-grained, cross-bedded, and black shale lenses. | 510 | 11 |
| 22 | 4 | Sandstone, white, fine-grained, cross-bedded, with black shale lenses. | 533 | 3 |
| 13 | 0 | Shale, slightly sandy, black. | 546 | 0 |
| 21 | 2 | Sandstone, white, fine- to medium-grained, cross-bedded. | 567 | 2 |

## BORE-HOLE 15 PIVAANSPOORT 56 (DIEPKLOOF) ELEVATION 5,150 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 18 | 0 | Soil and weathered sandstone. | 18 | 0 |
| 16 | 1 | Sandstone, laminated, grey, and black shale. | 34 | 1 |
| | 10 | Sandstone, grey, coarse-grained. | 34 | 11 |
| 2 | 2 | Sandstone, laminated, grey, and black shale. | 37 | 1 |
| 1 | 8 | Sandstone, grey, fine-grained, partly gritty. | 38 | 9 |
| 2 | 8 | Sandstone, grey, fine-grained, false-bedded. | 41 | 5 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 17 | 0 | Sandstone, laminated, grey and black shale. | 58 | 5 |
| 18 | 5 | Sandstone, white, fine-grained. | 76 | 10 |
| 50 | 5 | Sandstone, grey to white, with subordinate black shale bands. | 127 | 3 |
| 1 | 4 | Shale, carbonaceous. | 128 | 7 |
| 1 | 0 | Sandstone, grey, medium-grained, false-bedded. | 129 | 7 |
| 1 | 7 | Shale, partly carbonaceous, black. | 131 | 2 |
| 71 | 7 | Sandstone, white, medium-grained, with subordinate gritty sandstone bands. | 202 | 9 |
| 2 | 1 | Coal, mainly bright. GUS SEAM. | 204 | 10 |
| 50 | 0 | Sandstone, white, medium-grained, with subordinate gritty sandstone bands. | 254 | 10 |
| 1 | 0 | Coal, mainly bright, dull, shaly. DUNDAS (YARD) SEAM. | 255 | 10 |
| 2 | 9 | Shale, carbonaceous. | 258 | 7 |
| 5 | 7 | Sandstone, white, coarse-grained, gritty. | 264 | 2 |
| 1 | 6 | Shale, carbonaceous. | 265 | 8 |
| 1 | 0 | Coal, bright, laminated, and carbonaceous shale. DUNDAS (YARD) SEAM. | 266 | 8 |
| | 5 | Sandstone, white, with grey shale laminae. | 267 | 1 |
| | 1 | Coal, bright. DUNDAS (YARD) SEAM. | 267 | 2 |
| 4 | 9 | Sandstone, white, laminated, and grey shale. | 271 | 11 |
| 1 | 11 | Shale, sandy, black. | 273 | 10 |
| 4 | 7 | Sandstone, laminated, grey, fine-grained. | 278 | 5 |
| 5 | 4 | Shale, sandy, black. | 283 | 9 |
| 25 | 2 | Sandstone, grey, fine- to coarse-grained, with subordinate shale laminae. | 308 | 11 |
| 3 | 1 | Shale, black, with subordinate sandstone laminae. | 312 | 0 |
| 1 | 9 | Coal, bright at top, shaly at base. COKING SEAM. | 313 | 9 |

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 6 | 6 | Sandstone, grey, fine-grained, and black shale. | 320 | 3 |
| 17 | 1 | Sandstone, white, medium-grained, with subordinate grey shale laminae. | 337 | 4 |
| 1 | 4 | Sandstone, shaly, black. | 338 | 8 |
| 5 | 10 | Sandstone, white, medium-grained. | 344 | 6 |

BORE-HOLE 16 GAATWEEL 118 ELEVATION 6,449 FT.

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 23 | 0 | Soil and weathered sandstone. | 23 | 0 |
| 4 | 9 | Sandstone, white, coarse-grained, with clay-pellet conglomerate. | 27 | 9 |
| 12 | 6 | Sandstone, white, medium-grained, partly gritty, with subordinate black shale stringers. | 40 | 3 |
| 23 | 0 | Sandstone, white, coarse- to fine-grained, with subordinate black shale bands. | 63 | 3 |
| 8 | 9 | Sandstone, white, medium-grained. | 72 | 0 |
| 4 | 0 | Greywacke, laminated, and white, partly false-bedded sandstone. | 76 | 0 |
| 24 | 6 | Sandstone, white, medium-grained. | 100 | 6 |
| 3 | 7 | Dolerite. | 104 | 1 |
| 2 | 2 | Sandstone, indurated. | 106 | 3 |
| 237 | 7 | Dolerite. | 343 | 10 |
| 21 | 10 | Sandstone, white, fine- to medium-grained. | 365 | 8 |
| 2 | 5 | Sandstone, white, medium-grained, with subordinate grey, sandy shale laminae. | 368 | 1 |
|  | 2 | Dolerite. | 368 | 3 |
| 3 | 4 | Sandstone, white, medium-grained. | 371 | 7 |
| 1 | 8 | Sandstone, white, fine-grained, and grey, sandy shale. | 373 | 3 |
| 1 | 7 | Sandstone, white, medium-grained. | 374 | 10 |
|  | 4 | Sandstone, grey, shaly, and black shale. | 375 | 2 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 21 | 10 | Sandstone, white, medium-grained, with subordinate grey shale laminae. | 397 | 0 |
| 1 | 0 | Shale, black, and grey, shaly sandstone. | 398 | 0 |
| 4 | 6 | Sandstone, grey, fine-grained, with subordinate black shale laminae. | 402 | 6 |
| | 11 | Shale, black, sandy. | 403 | 5 |
| 3 | 1 | Sandstone, grey, false-bedded, with black, sandy shale laminae. | 406 | 6 |
| 2 | 10 | Sandstone, laminated, grey, false-bedded, and black, sandy shale. | 409 | 4 |
| 16 | 0 | Shale, sandy, black, with subordinate grey, false-bedded sandstone laminae. | 425 | 4 |
| | 10 | Sandstone, gritty, partly shaly. | 426 | 2 |
| 3 | 7 | Shale, black, and grey, partly gritty sandstone. | 429 | 9 |
| 7 | 0 | Sandstone, white, coarse-grained, and black shale. | 436 | 9 |
| 6 | 7 | Sandstone, grey, fine-grained, with subordinate black, partly calcareous shale laminae. | 443 | 4 |
| 8 | 1 | Shale, black, with grey sandstone laminae. | 451 | 5 |
| | 8 | Sandstone, white, coarse-grained. | 452 | 1 |
| 2 | 4 | Shale, sandy, black, with subordinate grey sandstone bands. | 454 | 5 |
| 15 | 1 | Sandstone, grey, fine- to coarse-grained, with subordinate black shale laminae. | 469 | 6 |
| 2 | 11 | Shale, black, and grey, fine-grained sandstone. | 472 | 5 |
| 2 | 2 | Sandstone, white, coarse-grained, with subordinate black shale bands. | 474 | 7 |
| 14 | 5 | Shale, black, and fine-grained, grey sandstone. | 489 | 0 |
| 18 | 3 | Sandstone, white, coarse-grained, with subordinate grey, sandy shale laminae. | 507 | 3 |
| 3 | 4 | Shale, carbonaceous. | 510 | 7 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 70 | 9 | Sandstone, white, coarse-grained, gritty. | 581 | 4 |
| 1 | 5 | Shale, carbonaceous. | 582 | 9 |
| 3 | 3 | Coal, mixed, mainly bright, pyritic at top. GUS SEAM. | 586 | 0 |
| | 9 | Shale, sandy, carbonaceous. | 586 | 9 |
| 7 | 0 | Sandstone, grey, fine- to coarse-grained. | 593 | 9 |
| 74 | 11 | Sandstone, white, coarse-grained. | 668 | 8 |
| 3 | 2 | Sandstone, grey, fine- to coarse-grained, partly gritty, with shale fragments. | 671 | 10 |
| 3 | 9 | Shale, sandy, carbonaceous. | 675 | 7 |
| 2 | 8 | Sandstone, grey, fine-grained. | 678 | 3 |
| 12 | 10 | Sandstone, grey, coarse- to fine-grained, cross-bedded, with numerous shale fragments. | 691 | 1 |
| 5 | 3 | Sandstone, shaly, dark. | 696 | 4 |
| 1 | 5 | Shale, sandy. | 697 | 9 |
| 1 | 11 | Sandstone, white, coarse-grained. | 699 | 8 |
| | 7 | Shale, sandy. | 700 | 3 |
| 2 | 0 | Coal, bright, banded, pyritic. COKING SEAM. | 702 | 3 |
| 9 | 0 | Shale, sandy, dark, at the bottom slightly carbonaceous. | 711 | 3 |
| 3 | 1 | Sandstone, shaly, dark. | 714 | 4 |
| 1 | 0 | Torbanite, shaly. | 715 | 4 |
| 87 | 10 | Sandstone, fine- to coarse-grained, partly laminated. | 803 | 2 |
| 15 | 10 | Shale, sandy, dark. | 819 | 0 |

BORE-HOLE 17 HAMMER 6 ELEVATION 5,375 FT. (Approx.)

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 26 | 0 | Sandstone, weathered, grey, fine- to medium-grained. | 26 | 0 |
| 185 | 6 | Dolerite. | 211 | 6 |
| 78 | 1 | Sandstone, grey, fine- to medium-grained, partly banded, graded bedding at base. | 289 | 7 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 2 | 2 | Greywacke, shaly towards the top. | 291 | 9 |
| 28 | 11 | Sandstone, grey, fine-grained, with shale laminae. | 320 | 8 |
| 9 | 0 | Sandstone, white, coarse-grained, with subordinate shale bands. | 329 | 8 |
| 11 | 4 | Sandstone, grey, fine-grained, with intercalated sandy shale laminae. | 341 | 0 |
| | 10 | Sandstone, white, coarse-grained. | 341 | 10 |
| 7 | 3 | Sandstone, white, fine- to coarse-grained. | 349 | 1 |
| | 10 | Shale, sandy. | 349 | 11 |
| 57 | 2 | Sandstone, white, coarse-grained, partly gritty. | 407 | 1 |
| 1 | 4 | Shale, sandy, indurated. | 408 | 5 |
| 460 | 4 | Dolerite (Zuinguin). | 868 | 9 |
| 4 | 6 | Shale, sandy. | 873 | 3 |
| 1 | 8 | Dolerite with shale. | 874 | 11 |
| 22 | 7 | Sandstone, white, fine-grained. | 897 | 6 |
| 4 | 11 | Dolerite. | 902 | 5 |
| 76 | 11 | Sandstone, white, coarse-grained, partly gritty. | 979 | 4 |
| 2 | 5 | Shale, sandy, dark. | 981 | 9 |
| 3 | 3 | Sandstone, white, fine-grained. | 985 | 0 |
| 2 | 6 | Shale, laminated. | 987 | 6 |
| | 2 | Coal, shaly, with a few thin bands of bright coal. | 987 | 8 |
| 5 | 0 | Shale, partly sandy, dark. | 992 | 8 |
| 1 | 0 | Sandstone, coarse-grained. | 993 | 8 |
| | 3 | Shale, black. | 993 | 11 |
| 5 | 1 | Sandstone, light grey, fine-grained. | 999 | 0 |
| 48 | 3 | Sandstone, dark, partly coarse-grained. | 1047 | 3 |
| 48 | 5 | Sandstone, light to dark grey, fine-grained. | 1095 | 8 |
| 6 | 9 | Greywacke, and fine-grained sandstone. | 1102 | 5 |
| 8 | 8 | Shale, sandy. | 1111 | 1 |
| 13 | 9 | Sandstone, partly shaly, grey, fine-grained. | 1124 | 10 |
| 15 | 1 | Shale, dark grey, carbonaceous in bottom 1 inch. | 1139 | 11 |

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 87 | 4 | Sandstone, light grey, mainly fine-grained, in the middle subordinate coarse-grained, sandstone bands. | 1227 | 3 |
| 2 | 8 | Sandstone, laminated. | 1229 | 11 |
| 3 | 8 | Shale, dark. | 1233 | 7 |
| 25 | 5 | Sandstone, white, medium-grained, partly coarse-grained, with a few thin, dark 1-inch bands of shale. | 1259 | 0 |
| 41 | 3 | Sandstone, grey, fine-grained, with shale laminae, graded bedding towards the base. | 1300 | 3 |
| 15 | 1 | Shale, dark. | 1315 | 4 |
| 2 | 9 | Sandstone, laminated, shaly. | 1318 | 1 |
| 14 | 2 | Shale, sandy, dark. | 1332 | 3 |
| 7 | 1 | Sandstone, light grey, coarse-grained. | 1339 | 4 |
| 10 | 10 | Sandstone, partly laminated, with numerous thin fragments and pellets of shale. | 1350 | 2 |
|  | 4 | Sandstone, white, gritty. | 1350 | 6 |
| 22 | 6 | Sandstone, fine-grained, with intercalated sandy shale bands. | 1373 | 0 |
| 42 | 9 | Shale, sandy. | 1415 | 9 |
| 70 | 0 | Sandstone, banded, with thin shale bands. | 1485 | 9 |

BORE-HOLE 18 WEIHOEK 171 ELEVATION 4,200 FT. (Approx.)

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 39 | 0 | Sandstone, coarse-grained to gritty, partly weathered shaly sandstone. | 39 | 0 |
| 2 | 1 | Flagstone, with irregular bands. | 41 | 1 |
| 45 | 2 | Sandstone, predominately coarse-grained. | 86 | 3 |
| 26 | 5 | Sandstone, white, predominantly fine-grained. | 112 | 8 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 18 | 11 | Sandstone, light to grey, fine-grained. | 131 | 7 |
| 1 | 5 | Greywacke, dark grey, laminated. | 133 | 0 |
| 33 | 9 | Sandstone, white, predominantly coarse-grained. | 166 | 9 |
| 22 | 2 | Sandstone, grey, shaly towards the bottom, fine-grained. | 188 | 11 |
| 5 | 8 | Greywacke, partly banded. | 194 | 7 |
| | 9 | Sandstone, white, coarse-grained. | 195 | 4 |
| 7 | 1 | Greywacke. | 202 | 5 |
| | 11 | Sandstone, coarse-grained. | 203 | 4 |
| 13 | 0 | Greywacke, banded. | 216 | 4 |
| 2 | 5 | Sandstone, shaly, grey, fine-grained. | 218 | 9 |
| 22 | 9 | Shale, blue-grey, sandy. | 241 | 6 |
| 132 | 8 | Sandstone, white, predominantly coarse-grained, with subordinate sandstone and shale laminae. | 374 | 2 |
| 8 | 10 | Shale and sandstone laminae. | 383 | 0 |
| 19 | 6 | Sandstone, coarse-grained, partly gritty. | 402 | 6 |
| 5 | 5 | Sandstone, grey, fine-grained. | 407 | 11 |
| 15 | 0 | Shale, sandy. | 422 | 11 |
| 15 | 9 | Greywacke, sandy, with numerous thin pellets of shale. | 438 | 8 |
| 56 | 2 | Sandstone, light yellow, coarse-grained, graded bedding. | 494 | 10 |
| 2 | 3 | Sandstone, fine-grained. | 497 | 1 |
| 4 | 8 | Shale, sandy. | 501 | 9 |
| 20 | 4 | Sandstone, shaly. | 522 | 1 |
| 13 | 11 | Sandstone, fine-grained, with greywacke. | 536 | 0 |
| 19 | 1 | Sandstone, shaly and sandy shale. | 555 | 1 |
| 26 | 6 | Shale, dark. | 581 | 7 |

BORE-HOLE 19 KLIPSPRUIT 178 ELEVATION 4,620 FT. (Approx.)

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 33 | 0 | Soil and clay. | 33 | 0 |
| 26 | 8 | Shale, sandy, dark, partly indurated. | 59 | 8 |
| 4 | 5 | Sandstone, laminated. | 64 | 1 |
| 2 | 10 | Sandstone, white, coarse-grained. | 66 | 11 |
| 67 | 4 | Dolerite. | 134 | 3 |
| 9 | 8 | Sandstone, banded. | 143 | 11 |
| 1 | 8 | Sandstone, grey, fine-grained. | 145 | 7 |
| 1 | 7 | Shale, sandy, dark grey. | 147 | 2 |
| 12 | 8 | Sandstone, grey, fine-grained. | 159 | 10 |
| 4 | 11 | Greywacke, laminated. | 164 | 9 |
| 8 | 11 | Sandstone, light grey, fine-grained. | 173 | 8 |
| 1 | 9 | Sandstone, shaly. | 175 | 5 |
| 5 | 4 | Greywacke, laminated, at bottom shaly sandstone. | 180 | 9 |
| 91 | 1 | Sandstone, white, coarse-grained, partly gritty, subordinate coal and shale fragments. | 271 | 10 |
| 1 | 0 | Shale, dark. | 272 | 10 |
| 13 | 9 | Sandstone, light grey, fine-grained, with a few sandy shale bands. | 286 | 7 |
| 2 | 6 | Greywacke, laminated. | 289 | 1 |
| 3 | 6 | Sandstone, white, fine-grained. | 292 | 7 |
| 23 | 7 | Sandstone, shaly. | 316 | 2 |
| 15 | 7 | Greywacke, sandy. | 331 | 9 |
| 5 | 11 | Shale, sandy. | 337 | 8 |
| 9 | 4 | Greywacke, with coarse-grained sandstone bands at bottom. | 347 | 0 |
| | 10 | Sandstone, light grey, fine-grained. | 347 | 10 |
| 1 | 2 | Greywacke, banded and laminated. | 349 | 0 |
| 1 | 2 | Sandstone, coarse-grained, dark grey, with laminated grey fine-grained sandstone. | 350 | 2 |
| 5 | 4 | Sandstone, light grey, fine-grained. | 355 | 6 |
| | 10 | Shale, with light grey fine-grained sandstone. | 356 | 4 |
| | 10 | Coal, mainly bright, finely banded, calcitic in cleats, pyritic. FRITZ SEAM. | 357 | 2 |

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 2 | 10 | Greywacke with intercalated fine-grained sandstone bands. | 360 | 0 |
| 1 | 4 | Sandstone, coarse- to fine-grained. | 361 | 4 |
| 25 | 6 | Sandstone, coarse-grained, white, with a few sandy shale bands. | 386 | 10 |
| 1 | 9 | Shale, black. | 388 | 7 |
| 2 | 8 | Coal, mainly dull, shaly, at top bright. ALFRED (MOSS) SEAM. | 391 | 3 |
| 2 | 11 | Greywacke, dark grey. | 394 | 2 |
| 1 | 3 | Sandstone, grey, fine-grained. | 395 | 5 |
| 39 | 6 | Sandstone, coarse-grained, at top fine-grained sandstone bands. | 434 | 11 |
|  | 2 | Coal, bright, finely banded. RIDER SEAM. | 435 | 1 |
| 4 | 11 | Sandstone, white, coarse- to fine-grained, with shale laminae. | 440 | 0 |
| 4 | 9 | Coal, mainly bright, partly alternating bands of dull and bright coal, subordinate carbonaceous shale. GUS SEAM. | 444 | 9 |
|  | 2 | Shale, carbonaceous, sandy. | 444 | 11 |
| 1 | 8 | Sandstone, grey, fine-grained. | 446 | 7 |

BORE-HOLE 20 VAALBANK 103 ELEVATION 4,400 FT. (Approx.)

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 10 | 0 | Soil and sandy clay. | 10 | 0 |
| 21 | 0 | Clay, sandy, with dolerite boulders. | 31 | 0 |
| 36 | 0 | Shale, sandy. | 67 | 0 |
| 26 | 4 | Sandstone, fine- to coarse-grained. | 93 | 4 |
| 2 | 5 | Dolerite. | 95 | 9 |
|  | 5 | Sandstone, coarse-grained. | 96 | 2 |
| 2 | 0 | Dolerite. | 98 | 2 |
| 19 | 5 | Sandstone, fine- coarse-grained. | 117 | 7 |

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 4 | 11 | Coal, mainly dull, shaly in parts, 8 inches sandstone and carbonaceous shale, at bottom a few thin bright stringers. ALFRED (MOSS) SEAM. | 122 | 6 |
| 2 | 1 | Sandstone, fine-grained. | 124 | 7 |
|  | 10 | Shale, sandy, dark, with numerous thin, bright, coal stringers. | 125 | 5 |
| 10 | 0 | Sandstone, light coloured, fine-grained, a few laminated shale bands at top. | 135 | 5 |
|  | 11 | Coal, bright, slightly calcitic in cleats, and carbonaceous shale. RIDER SEAM. | 136 | 4 |
|  | 10 | Sandstone, dirty grey, laminated. | 137 | 2 |
| 13 | 9 | Sandstone, light grey, coarse-grained. | 150 | 11 |
| 1 | 11 | Coal, mainly bright, with a few dull coal bands, pyritic. GUS SEAM. | 152 | 10 |
| 2 | 3 | Sandstone, grey, fine-grained. | 155 | 1 |
| 5 | 0 | Sandstone, white, gritty. | 160 | 1 |

## BORE-HOLE 21 PIVAANS WATER VAAL 267 ELEVATION 5,553 FT.

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 57 | 0 | Soil, clay, boulders. | 57 | 0 |
| 10 | 10 | Shale, blue. | 67 | 10 |
| 22 | 4 | Sandstone. | 90 | 2 |
| 339 | 11 | Dolerite, coarse-grained. | 430 | 1 |
| 4 | 10 | Sandstone, white. | 434 | 11 |
| 30 | 9 | Dolerite, coarse-grained. | 465 | 8 |
| 5 | 10 | Sandstone, shaly. | 471 | 6 |
| 91 | 5 | Sandstone, coarse-grained. | 562 | 11 |
| 11 | 1 | Sandstone, shaly. | 574 | 0 |
| 9 | 1 | Sandstone, coarse-grained. | 583 | 1 |
| 6 | 10 | Sandstone, shaly. | 589 | 11 |
| 40 | 8 | Dolerite, porphyritic. | 630 | 7 |
| 3 | 5 | Sandstone, medium-grained. | 634 | 0 |
| 21 | 0 | Sandstone, shaly. | 655 | 0 |
| 51 | 10 | Sandstone, grey, fine-grained. | 706 | 10 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| | 1 | Coal. UPPER ELAND SEAM. | 706 | 11 |
| 8 | 1 | Sandstone, grey, fine-grained. | 715 | 0 |
| 5 | 11 | Sandstone, shaly. | 720 | 11 |
| | 4 | Coal. LOWER ELAND SEAM. | 721 | 3 |
| 2 | 5 | Sandstone, shaly. | 723 | 8 |
| | 1 | Coal. LOWER ELAND SEAM. | 723 | 9 |
| 18 | 4 | Sandstone, shaly. | 742 | 1 |
| 5 | 11 | Shale, black. | 748 | 0 |
| 32 | 6 | Sandstone, shaly. | 780 | 6 |
| 8 | 7 | Sandstone and shale. | 789 | 1 |
| 20 | 7 | Shale, sandy. | 809 | 8 |
| 6 | 11 | Sandstone, white, medium-grained. | 816 | 7 |
| 29 | 4 | Sandstone, white, thinly bedded. | 845 | 11 |
| 13 | 9 | Sandstone and shale. | 859 | 8 |
| | 1 | Sandstone, gritty. | 859 | 9 |
| 3 | 3 | Coal, dull, shaly, with subordinate carbonaceous shale bands and thin bright coal stringers. ALFRED (MOSS) SEAM. | 863 | 0 |
| 24 | 6 | Sandstone, gritty, and shale laminae. | 887 | 6 |
| | 3 | Coal. RIDER SEAM. | 887 | 9 |
| 4 | 8 | Sandstone, shaly. | 892 | 5 |
| | 5 | Coal. RIDER SEAM. | 892 | 10 |
| 1 | 3 | Sandstone, shaly. | 894 | 1 |
| 28 | 6 | Sandstone, white, medium-grained. | 922 | 7 |
| 2 | 1 | Coal, mixed, mainly dull, shaly. GUS SEAM. | 924 | 8 |
| 20 | 4 | Sandstone, white, coarse-grained. | 945 | 0 |
| | 1 | Coal. | 945 | 1 |
| 25 | 11 | Sandstone, with intercalated shale layers. | 971 | 0 |
| | 7 | Coal, dull, shaly 3 inches mixed coal, and carbonaceous shale. | 971 | 7 |
| 5 | 5 | Shale, black. | 977 | 0 |
| | 1 | Coal. | 977 | 1 |
| 9 | 1 | Sandstone, shaly. | 986 | 2 |
| | 2 | Coal. | 986 | 4 |
| 9 | 10 | Shale, black. | 996 | 2 |
| | 2 | Coal. | 996 | 4 |
| 7 | 0 | Shale, black. | 1003 | 4 |
| | 1 | Coal. | 1003 | 5 |
| | 10 | Sandstone. | 1004 | 3 |
| | 4 | Coal. | 1004 | 7 |
| 15 | 3 | Sandstone, fine-grained. | 1019 | 10 |
| 5 | 8 | Dolerite. | 1025 | 6 |
| 1 | 3 | Coal, dull. COKING SEAM. | 1026 | 9 |
| 18 | 6 | Sandstone, shaly. | 1045 | 3 |
| 46 | 9 | Sandstone. white, massive. | 1092 | 0 |

## BORE-HOLE 22 PIVAANS WATER VAAL 267 ELEVATION 5,809 FT.

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 22 | 0 | Soil and weathered shale. | 22 | 0 |
| 141 | 0 | Shale, black. | 163 | 0 |
| 10 | 6 | Shale, indurated. | 173 | 6 |
| 20 | 7 | Shale, grey, banded. | 194 | 1 |
| 164 | 11 | Dolerite. | 359 | 0 |
| 5 | 3 | Shale, indurated. | 364 | 3 |
| 7 | 3 | Sandstone, shaly. | 371 | 6 |
| 33 | 8 | Shale, black, with sandstone laminae. | 405 | 2 |
| 21 | 0 | Sandstone, with intercalated black shale laminae. | 426 | 2 |
| 4 | 1 | Shale, sandy. | 430 | 3 |
| 1 | 6 | Dolerite. | 431 | 9 |
| 1 | 3 | Sandstone, laminated. | 433 | 0 |
| 4 | 0 | Sandstone, white, medium-grained. | 437 | 0 |
| 9 | 3 | Sandstone, calcareous, laminated. | 446 | 3 |
| 46 | 10 | Sandstone, with shale laminae. | 493 | 1 |
| 9 | 2 | Shale, black, with sandstone laminae. | 502 | 3 |
| 14 | 6 | Shale, black. | 516 | 9 |
| 6 | 2 | Sandstone, with shale bands, cross-bedded. | 522 | 11 |
| 5 | 1 | Sandstone, grey, laminated. | 528 | 0 |
| 7 | 4 | Sandstone, white, medium-grained, partly gritty, with garnet. | 535 | 4 |
| 7 | 9 | Sandstone, shaly. | 543 | 1 |
| 79 | 10 | Sandstone, white, fine- to medium-grained. | 622 | 11 |
| 10 | 1 | Sandstone, grey, laminated. | 633 | 0 |
| 5 | 3 | Sandstone, white, medium-grained. | 638 | 3 |
|  | 9 | Sandstone, with thin shale bands. | 639 | 0 |
| 1 | 1 | Siltstone. | 640 | 1 |
| 14 | 11 | Sandstone, grey, cross-bedded, at top 10 inches black shale. | 655 | 0 |
| 20 | 3 | Sandstone, white, fine-grained. | 675 | 3 |
|  | 1 | Shale, carbonaceous. | 675 | 4 |
|  | 3 | Coal, bright. UPPER ELAND SEAM. | 675 | 7 |
| 12 | 7 | Sandstone, grey, fine-grained, with black shale bands. | 688 | 2 |
|  | 3 | Coal, bright. LOWER ELAND SEAM. | 688 | 5 |
|  | 1 | Shale, carbonaceous. | 688 | 6 |
|  | 2 | Coal, bright. LOWER ELAND SEAM. | 688 | 8 |
|  | 2 | Sandstone, cross-bedded. | 688 | 10 |
|  | 3 | Coal, dull. LOWER ELAND SEAM. | 689 | 1 |
| 11 | 2 | Sandstone, white, with shale bands. | 700 | 3 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 32 | 7 | Sandstone, calcareous, grey, laminated. | 732 | 10 |
| 18 | 11 | Shale, black. | 751 | 9 |
| 2 | 8 | Sandstone, grey, medium-grained. | 754 | 5 |
| 1 | 10 | Dolerite. | 756 | 3 |
| 2 | 0 | Sandstone, white, fine-grained. | 758 | 3 |
| | 2 | Pyrite. | 758 | 5 |
| 3 | 2 | Sandstone, white. | 761 | 7 |
| 9 | 0 | Sandstone, grey, calcareous, cross-bedded. | 770 | 7 |
| 2 | 2 | Shale, black. | 772 | 9 |
| 24 | 2 | Sandstone, white, gritty. | 796 | 11 |
| 9 | 0 | Sandstone, laminated. | 805 | 11 |
| 2 | 10 | Shale, black. | 808 | 9 |
| 11 | 5 | Sandstone, grey, cross-bedded, with black shale bands. | 820 | 2 |
| 11 | 11 | Sandstone, white, fine-grained. | 832 | 1 |
| 2 | 4 | Coal, dull, shaly, 4 inches carbonaceous shale at bottom. ALFRED (MOSS) SEAM. | 834 | 5 |
| 1 | 0 | Shale, carbonaceous. | 835 | 5 |
| 26 | 4 | Sandstone, white, gritty to coarse-grained. | 861 | 9 |
| 3 | 4 | Shale, black. | 865 | 1 |
| 22 | 10 | Sandstone, white, gritty. | 887 | 11 |
| | 8 | Shale, carbonaceous. | 888 | 7 |
| 2 | 8 | Sandstone, with shale bands. | 891 | 3 |
| | 5 | Coal, dull, with carbonaceous shale. GUS SEAM. | 891 | 8 |
| | 5 | Shale, black. | 892 | 1 |
| 1 | 0 | Siltstone. | 893 | 1 |
| 12 | 2 | Sandstone, white, coarse-grained. | 905 | 3 |
| 1 | 1 | Shale, carbonaceous, with a few coal stringers. | 906 | 4 |
| 25 | 0 | Sandstone, white, coarse-grained. | 931 | 4 |
| 1 | 9 | Shale, black. | 933 | 1 |
| 4 | 9 | Sandstone, grey, shaly. | 937 | 10 |
| 11 | 2 | Shale, indurated, with sandstone bands. | 949 | 0 |
| 10 | 0 | Sandstone, white, medium-grained. | 959 | 0 |
| 6 | 0 | Sandstone, grey, shaly, 6 inches indurated shale at bottom. | 965 | 0 |
| 96 | 0 | Dolerite. | 1061 | 0 |

BORE-HOLE 23 ELANDSNEK 4 ELEVATION 5,945 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 18 | 2 | Soil and boulders. | 18 | 2 |
| 6 | 2 | Sandstone, white, coarse-grained. | 24 | 4 |
| 15 | 5 | Shale, indurated, sandy. | 39 | 9 |
| 14 | 1 | Sandstone, white, coarse-grained, with garnet. | 53 | 10 |
| 172 | 7 | Dolerite, coarse-grained. | 226 | 5 |
| 17 | 3 | Shale, indurated, sandy, grey. | 243 | 8 |
| 76 | 6 | Shale, black, laminated. | 320 | 2 |
| 357 | 2 | Shale, black, laminated, partly decomposed. | 677 | 4 |
| 7 | 9 | Sandstone, white, with shale laminae | 685 | 1 |
| 29 | 11 | Shale, sandy. | 715 | 0 |
| 26 | 5 | Sandstone, white, cross-bedded. | 741 | 5 |
| 72 | 9 | Sandstone, grey to white, partly laminated, fine-grained. | 814 | 2 |
| 21 | 8 | Shale, with intercalated sandstone bands. | 835 | 10 |
| | 10 | Sandstone, gritty. | 836 | 8 |
| 26 | 0 | Sandstone, grey, fine-grained. | 862 | 8 |
| 4 | 1 | Dolerite. | 866 | 9 |
| 94 | 11 | Sandstone, white, fine- to medium-grained. | 961 | 8 |
| 13 | 11 | Sandstone, grey, laminated, with shale laminae. | 975 | 7 |
| 27 | 3 | Sandstone, white, fine-grained, impregnated with oil in parts. | 1002 | 10 |
| | 10 | Coal, bright and dull, with carbonaceous shale. UPPER ELAND SEAM. | 1003 | 8 |
| | 6 | Shale, carbonaceous. | 1004 | 2 |
| 12 | 3 | Sandstone, shaly. | 1016 | 5 |
| | 3 | Coal, bright. LOWER ELAND SEAM. | 1016 | 8 |
| | 9 | Shale, carbonaceous. | 1017 | 5 |
| | 7 | Sandstone, grey, medium-grained. | 1018 | 0 |
| | 2 | Coal, bright. LOWER ELAND SEAM. | 1018 | 2 |
| 81 | 0 | Sandstone, grey, laminated, with shale laminae. | 1099 | 2 |
| 37 | 10 | Sandstone, white, medium-grained, grey shale bands at bottom. | 1137 | 0 |
| 2 | 11 | Shale, sandy. | 1139 | 11 |
| 11 | 1 | Sandstone, grey, cross-bedded. | 1151 | 0 |
| | 1 | Coal, bright, pyritic. FRITZ SEAM. | 1151 | 1 |
| | 7 | Shale, carbonaceous. | 1151 | 8 |
| 26 | 10 | Sandstone, white, medium- to fine-grained. | 1178 | 6 |

B.H.23 (contd.)

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| | 2 | Shale, black. | 1178 | 8 |
| 2 | 2 | Coal, dull, shaly, and carbonaceous shale. ALFRED (MOSS) SEAM. | 1180 | 10 |
| | 11 | Shale, carbonaceous. | 1181 | 9 |
| 30 | 4 | Sandstone, white, gritty. | 1212 | 1 |
| 4 | 3 | Sandstone, grey, with shale bands. | 1216 | 4 |
| | 9 | Shale, carbonaceous. | 1217 | 1 |
| | 1 | Coal, bright. RIDER SEAM. | 1217 | 2 |
| | 1 | Shale, carbonaceous. | 1217 | 3 |
| 9 | 10 | Sandstone, grey, medium-grained. | 1227 | 1 |
| | 10 | Shale, carbonaceous, with bright coal stringers. RIDER SEAM. | 1227 | 11 |
| 3 | 2 | Sandstone, gritty. | 1231 | 1 |
| 4 | 6 | Sandstone, white, medium-grained, with shale bands. | 1235 | 7 |
| 1 | 7 | Coal, alternating bands of bright coal and dull granular coal, slightly shaly at top. UPPER GUS (MAIN) SEAM. | 1237 | 2 |
| 8 | 3 | Sandstone, grey, fine-grained. | 1245 | 5 |
| 5 | 6 | Sandstone, white, medium-grained. | 1250 | 11 |
| 1 | 6 | Coal, dull, heavy, burnt, with a few bright coal bands. LOWER GUS SEAM. | 1252 | 5 |
| 2 | 8 | Sandstone, shaly, grey, laminated. | 1255 | 1 |
| 7 | 10 | Sandstone, white, gritty, with garnet. | 1262 | 11 |

## BORE-HOLE 24 KLIPPLAATDRIFT 120 ELEVATION, 5,740 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 3 | 0 | Soil | 3 | 0 |
| 2 | 0 | Boulders. | 5 | 0 |
| 78 | 7 | Shale, blue, partly weathered. | 83 | 7 |
| 1 | 0 | Sandstone, white, fine-grained. | 84 | 7 |
| 16 | 1 | Shale, indurated. | 100 | 8 |
| 190 | 4 | Dolerite (Zuinguin). | 291 | 0 |
| 3 | 5 | Shale, indurated. | 294 | 5 |
| | 7 | Dolerite. | 295 | 0 |
| 5 | 5 | Shale, indurated. | 300 | 5 |
| 6 | 7 | Dolerite. | 307 | 0 |
| 1 | 4 | Shale, indurated. | 308 | 4 |
| 33 | 9 | Sandstone, shaly, white to grey. | 342 | 1 |
| 8 | 10 | Siltstone. | 350 | 11 |
| 27 | 9 | Sandstone, white, with shale bands. | 378 | 8 |
| 4 | 10 | Dolerite. | 383 | 6 |
| | 10 | Shale, indurated. | 384 | 4 |
| 6 | 0 | Dolerite. | 390 | 4 |
| 8 | 0 | Sandstone, white, fine-grained. | 398 | 4 |
| 2 | 1 | Shale, with sandstone bands. | 400 | 5 |
| 152 | 1 | Dolerite. | 552 | 6 |
| 19 | 4 | Sandstone, white, medium-grained. | 571 | 10 |
| 21 | 9 | Shale, with laminated sandstone. | 593 | 7 |
| 24 | 2 | Sandstone, white, with shale bands. | 617 | 9 |
| 101 | 11 | Sandstone, white, fine-grained. | 719 | 8 |
| 11 | 7 | Sandstone, shaly, grey, laminated, partly calcareous. | 731 | 3 |
| | 0½ | Coal, bright. | 731 | 3½ |
| 9 | 8½ | Sandstone, grey, laminated, with shale bands. | 741 | 0 |
| 19 | 4 | Sandstone, white, medium-grained, graded bedding at bottom. | 760 | 4 |
| | 1 | Coal, bright, UPPER ELAND SEAM. | 760 | 5 |
| 8 | 1 | Shale, with intercalated sandstone bands. | 768 | 6 |
| 8 | 0 | Sandstone, grey, laminated, calcareous, carbonaceous shale at bottom. | 776 | 6 |
| | 7 | Coal, mainly bright, dull, shaly. LOWER ELAND SEAM. | 777 | 1 |
| 52 | 7 | Sandstone, grey, laminated, fine-grained. | 829 | 8 |
| 15 | 7 | Sandstone, grey, with intercalated shale bands. | 845 | 3 |

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 17 | 0 | Sandstone, grey, fine-grained, cross-bedded, black shale at bottom. | 862 | 3 |
| 26 | 2 | Sandstone, white, gritty to coarse-grained. | 888 | 5 |
| 23 | 11 | Sandstone, grey, calcareous, with shale bands. | 912 | 4 |
| 1 | 0 | Coal, mainly carbonaceous shale, and bright coal stringers. FRITZ SEAM. | 913 | 4 |
| 2 | 4 | Shale, sandy, carbonaceous at top. | 915 | 8 |
| 11 | 3 | Sandstone, white, medium-grained. | 926 | 11 |
| 3 | 2 | Coal, mainly dull, shaly in parts. ALFRED (MOSS) SEAM. | 930 | 1 |
|  | 10 | Shale, black, carbonaceous. | 930 | 11 |
| 32 | 11 | Sandstone, white, coarse-grained, partly gritty. | 963 | 10 |
| 1 | 0 | Coal, mixed, mainly bright. RIDER SEAM. | 964 | 10 |
| 1 | 5 | Shale, black. | 966 | 3 |
|  | 4 | Coal, mixed, mainly bright. RIDER SEAM. | 966 | 7 |
| 2 | 7 | Sandstone, shaly, 6 inches carbonaceous shale at top. | 969 | 2 |
| 17 | 3 | Sandstone, white, coarse-grained. | 986 | 5 |
|  | 9 | Coal, bright, partly banded. | 987 | 2 |
| 3 | 2 | Sandstone, grey, shaly. | 990 | 4 |
|  | 4 | Sandstone and bright coal. | 990 | 8 |
| 3 | 6 | Coal, mainly dull, shaly in parts, and alternating bands of dull and bright coal. UPPER GUS (MAIN) SEAM. | 994 | 2 |
| 8 | 0 | Sandstone, grey, laminated, fine-grained. | 1002 | 2 |
| 4 | 10 | Coal, mixed, mainly dull at top, bright towards bottom 2 inches carbonaceous shale with bright coal stringers at bottom. LOWER GUS SEAM. | 1007 | 0 |
| 3 | 5 | Shale, sandy, grey. | 1010 | 5 |
| 20 | 8 | Sandstone, white, gritty. | 1031 | 1 |

BORE-HOLE 25 ELANDSNEK 4 ELEVATION 5,494 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 4 | 0 | Soil and decomposed dolerite. | 4 | 0 |
| 459 | 2 | Dolerite. | 463 | 2 |
| 22 | 7 | Sandstone, shaly, shale bands at bottom. | 485 | 9 |
| 19 | 0 | Sandstone, white, and shale bands. | 504 | 9 |
| 9 | 7 | Dolerite. | 514 | 4 |
| 3 | 6 | Siltstone, 7 inches white, medium-grained sandstone at bottom. | 517 | 10 |
| 15 | 4 | Dolerite. | 533 | 2 |
| 8 | 6 | Sandstone, white, cross-bedded, fine-grained, with a few shale bands. | 541 | 8 |
| 5 | 4 | Sandstone, calcareous. | 547 | 0 |
| 22 | 2 | Sandstone, grey, laminated. | 569 | 2 |
| 46 | 3 | Sandstone, white, medium-grained. | 615 | 5 |
| 19 | 8 | Shale, sandy, black, and sandstone bands. | 635 | 1 |
| 25 | 8 | Sandstone, white to grey, and shale bands. | 660 | 9 |
| 48 | 10 | Sandstone, white, medium-grained. | 709 | 7 |
| 12 | 2 | Sandstone, laminated, 2 feet 3 inches medium-grained sandstone at base. | 721 | 9 |
| 24 | 4 | Sandstone, grey to white, with shale bands. | 746 | 1 |
| 31 | 3 | Sandstone, white, medium-grained, 4 inches indurated shale at bottom. | 777 | 4 |
| 77 | 3 | Dolerite. | 854 | 7 |
| 14 | 1 | Sandstone, white to grey, laminated. | 868 | 8 |
| 2 | 8 | Shale with sandstone bands. | 871 | 4 |
| 2 | 9 | Sandstone, white, coarse-grained. | 874 | 1 |
| 13 | 11 | Sandstone, grey, fine-grained, occasionally laminated. | 888 | 0 |
| 2 | 5 | Shale, carbonaceous. | 890 | 5 |
| 50 | 2 | Sandstone, shaly, grey, laminated. | 940 | 7 |
| 33 | 7 | Sandstone, white, coal stringer at bottom. | 974 | 2 |
| 23 | 8 | Sandstone, laminated, with shale bands. | 997 | 10 |
| 12 | 8 | Sandstone, white, fine- to medium-grained. | 1010 | 6 |
| 1 | 1 | Coal, mainly shale, dull. ALFRED (MOSS) SEAM. | 1011 | 7 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| | 4 | Sandstone, shaly, with coal stringer. | 1011 | 11 |
| 47 | 5 | Sandstone, white, coarse-grained, partly gritty. | 1059 | 4 |
| 3 | 5 | Shale, carbonaceous, sandy, with coal stringer. | 1062 | 9 |
| 13 | 1 | Sandstone, white, coarse-grained. | 1075 | 10 |
| 2 | 10 | Coal, mixed, partly dull. GUS SEAM. | 1078 | 8 |
| 19 | 4 | Sandstone, white, coarse-grained, partly gritty, with coal stringer. | 1098 | 0 |
| 4 | 3 | Shale, laminated, carbonaceous at top. | 1102 | 3 |
| 3 | 1 | Sandstone, white, medium-grained. | 1105 | 4 |
| | 5 | Sandstone, shale. | 1105 | 9 |
| | 5 | Coal, bright. | 1106 | 2 |
| 4 | 0 | Sandstone, white, gritty. | 1110 | 2 |
| 9 | 0 | Sandstone, grey. | 1119 | 2 |
| 2 | 3 | Coal, mainly bright, partly dull, mixed at base, at top and bottom 1½ inches sandstone. DUNDAS (YARD) SEAM. | 1121 | 5 |
| 4 | 7 | Shale, carbonaceous, more or less sandy. | 1126 | 0 |
| 10 | 2 | Sandstone, shaly, laminated. | 1136 | 2 |
| 5 | 4 | Sandstone, grey, calcareous at top. | 1141 | 6 |
| 2 | 2 | Sandstone, coarse-grained, partly gritty, impregnated with oil. | 1143 | 8 |
| 1 | 9 | Sandstone. | 1145 | 5 |
| 1 | 10 | Sandstone, coarse-grained, impregnated with oil. | 1147 | 3 |
| 4 | 5 | Sandstone, white, coarse-grained. | 1151 | 8 |
| 3 | 8 | Shale, black, carbonaceous at top. | 1155 | 4 |
| 3 | 8 | Sandstone, white, medium-grained, with black shale bands. | 1159 | 0 |
| 3 | 0 | Shale, black. | 1162 | 0 |
| | 10 | Coal, bright. SEAM "Z". | 1162 | 10 |
| 7 | 1 | Sandstone, white, fine- to medium-grained. | 1169 | 11 |
| 7 | 3 | Sandstone, shaly, grey, laminated. | 1177 | 2 |
| 4 | 7 | Shale, sandy, black. | 1181 | 9 |
| 1 | 6 | Coal, bright. COKING SEAM. | 1183 | 3 |
| 10 | 7 | Sandstone, grey, fine-grained, cross-bedded. | 1193 | 10 |

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 6 | 5 | Sandstone, white, fine-grained. | 1200 | 3 |
| 6 | 5 | Shale, black, with sandstone laminae. | 1206 | 8 |
| 4 | 8 | Sandstone, white, medium-grained. | 1211 | 4 |
| 2 | 5 | Shale, black. | 1213 | 9 |
|  | 7 | Sandstone, white, fine-grained. | 1214 | 4 |
|  | 7 | Shale, black. | 1214 | 11 |
| 1 | 3 | Coal, with 5 inches grey sandstone. TARGAS SEAM. | 1216 | 2 |
|  | 2 | Shale, carbonaceous. | 1216 | 4 |
| 43 | 7 | Sandstone, grey to white, fine-grained, with shale laminae. | 1259 | 11 |
| 4 | 0 | Shale, black, with sandstone bands. | 1263 | 11 |
| 3 | 2 | Sandstone, grey, laminated. | 1267 | 1 |
| 4 | 4 | Shale, black. | 1271 | 5 |
| 14 | 3 | Sandstone, white to grey, medium-grained. | 1285 | 8 |
| 4 | 4 | Shale, black, with sandstone bands. | 1290 | 0 |
| 32 | 10 | Sandstone, white, medium- to coarse-grained, with garnet. | 1322 | 10 |
| 11 | 1 | Dolerite. | 1333 | 11 |
| 9 | 5 | Sandstone, white, gritty. | 1343 | 4 |
| 23 | 8 | Dolerite. | 1367 | 0 |

## BORE-HOLE 26 KLIPPLAATDRIFT 120 ELEVATION 5,832 FT.

| Thickness recovered Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 2 | 0 | Soil | 2 | 0 |
| 237 | 10 | Shale, blue. | 239 | 10 |
| 20 | 5 | Shale, sandy. | 260 | 3 |
| 9 | 7 | Sandstone, white, fine-grained, cross-bedded. | 269 | 10 |
| 177 | 5 | Dolerite. | 447 | 3 |
| 32 | 4 | Shale, indurated. | 479 | 7 |
| 18 | 0 | Sandstone, white, with shale bands. | 497 | 7 |
| 31 | 7 | Sandstone, shaly, grey, cross-bedded, laminated at base. | 529 | 2 |
| 32 | 5 | Sandstone, white, medium-grained. | 561 | 7 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 30 | 8 | Sandstone, grey, laminated, with shale bands. | 592 | 3 |
| 19 | 9 | Sandstone, white, medium-grained, 5 feet grey sandstone at base. | 612 | 0 |
| 1 | 3 | Sandstone, shaly. | 613 | 3 |
| | 9 | Dolerite. | 614 | 0 |
| 6 | 3 | Sandstone, white, medium-grained. | 620 | 3 |
| | 9 | Sandstone, shaly. | 621 | 0 |
| 1 | 4 | Dolerite. | 622 | 4 |
| 1 | 10 | Shale, sandy. | 624 | 2 |
| 121 | 7 | Sandstone, white, fine-grained. | 745 | 9 |
| | 1 | Coal, bright. ELAND SEAM. | 745 | 10 |
| 19 | 3 | Sandstone, white to grey, fine-grained, laminated. | 765 | 1 |
| 23 | 10 | Sandstone, white, fine-grained. | 788 | 11 |
| 99 | 10 | Dolerite. | 888 | 9 |
| 16 | 6 | Sandstone, white, fine-grained, partly calcareous. | 905 | 3 |
| 15 | 0 | Sandstone, grey, laminated, with shale bands. | 920 | 3 |
| 9 | 5 | Sandstone, white, fine-grained. | 929 | 8 |
| 17 | 0 | Sandstone, white to grey, cross-bedded. | 946 | 8 |
| 17 | 9 | Sandstone, white, fine-grained. | 964 | 5 |
| 69 | 1 | Dolerite. | 1033 | 6 |
| 5 | 5 | Sandstone, white, fine-grained. | 1038 | 11 |
| | 11 | Dolerite. | 1039 | 10 |
| 31 | 3 | Sandstone, grey, with shale bands, 7 feet white, fine-grained sandstone at top. | 1071 | 1 |
| 12 | 3 | Sandstone, grey, medium-grained. | 1083 | 4 |
| 2 | 2 | Coal, dull, mainly shaly. ALFRED (MOSS) SEAM. | 1085 | 6 |
| | 10 | Sandstone, grey, cross-bedded. | 1086 | 4 |
| | 11 | Shale, carbonaceous, and shaly coal. ALFRED (MOSS) SEAM. | 1087 | 3 |
| | 8 | Shale, sandy, carbonaceous. | 1087 | 11 |
| 40 | 9 | Sandstone, white, coarse-grained. | 1128 | 8 |
| | 6 | Coal, bright, pyritic. RIDER SEAM. | 1129 | 2 |
| 2 | 5 | Shale, black, carbonaceous, with coal stringers. | 1131 | 7 |
| | 9 | Coal, bright, calcitic. RIDER SEAM. | 1132 | 4 |
| 1 | 3 | Shale, black, carbonaceous. | 1133 | 7 |
| | 2 | Coal, dull. | 1133 | 9 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 1 | 2 | Shale, black, carbonaceous. | 1134 | 11 |
| 3 | 7 | Sandstone, white, coarse-grained. | 1138 | 6 |
| | 7 | Coal, alternating bands of bright, pyritic coal, and carbonaceous shale. UPPER GUS (MAIN) SEAM. | 1139 | 1 |
| 2 | 4 | Sandstone, fine-grained, calcareous. | 1141 | 5 |
| | 2 | Coal, bright. LOWER GUS SEAM. | 1141 | 7 |
| | 2 | Shale, carbonaceous, with coal stringers. | 1141 | 9 |
| | 9 | Sandstone, grey. | 1142 | 6 |
| 3 | 6 | Coal, mainly dull, bright coal mainly at base. LOWER GUS SEAM. | 1146 | 0 |
| 15 | 8 | Sandstone, white, medium-grained. | 1161 | 8 |
| 1 | 1 | Coal, bright. | 1162 | 9 |
| 22 | 0 | Sandstone, white to grey, coarse-grained, shaly sandstone at top. | 1184 | 9 |
| 2 | 6 | Coal, bright. DUNDAS (YARD) SEAM. | 1187 | 3 |
| 1 | 1 | Sandstone, grey, laminated, with coal stringers. | 1188 | 4 |
| | 1 | Coal, bright. DUNDAS (YARD) SEAM. | 1188 | 5 |
| | 4 | Sandstone, white, fine-grained. | 1188 | 9 |
| | 9 | Coal, bright, with subordinate thin, carbonaceous shale bands. DUNDAS (YARD) SEAM. | 1189 | 6 |
| 5 | 5 | Sandstone, grey, laminated. | 1194 | 11 |
| | 3 | Coal, bright. DUNDAS (YARD) SEAM. | 1195 | 2 |
| 41 | 9 | Sandstone, grey, laminated, with shale bands. | 1236 | 11 |
| 2 | 0 | Coal, bright, banded pyritic. COKING SEAM. | 1238 | 11 |
| 16 | 8 | Sandstone, grey, laminated, calcareous, with shale laminae. | 1255 | 7 |
| 5 | 4 | Shale, black, sandy. | 1260 | 11 |
| 27 | 2 | Sandstone, dirty white, fine-grained. | 1288 | 1 |

## BORE-HOLE 27 RUSTVERWACHT 151 ELEVATION 4,181 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 23 | 9 | Soil, and weathered sandstone. | 23 | 9 |
| 4 | 0 | Coal, mainly bright, pyritic weathered, stained yellow. GUS SEAM. | 27 | 9 |
| 62 | 1 | Sandstone, white, medium-grained. | 89 | 10 |
| | 3 | Sandstone, grey, with a few thin bands of bright coal. | 90 | 1 |
| | 4 | Coal, bright. DUNDAS (YARD) SEAM. | 90 | 5 |
| 2 | 11 | Sandstone, grey, laminated. | 93 | 4 |
| 2 | 11 | Shale, carbonaceous. | 96 | 3 |
| 19 | 3 | Sandstone, grey, cross-bedded. | 115 | 6 |
| 10 | 2 | Sandstone, gritty. | 125 | 8 |
| 8 | 4 | Sandstone, grey, calcareous. | 134 | 0 |
| 17 | 11 | Sandstone, white, medium-grained. | 151 | 11 |
| 1 | 1 | Coal, bright, pyritic. COKING SEAM. | 153 | 0 |
| 1 | 4 | Shale, black, sandy. | 154 | 4 |
| 74 | 1 | Sandstone, white, medium-grained, with coal stringers. | 228 | 5 |
| 10 | 3 | Sandstone, cross-bedded, with a few thin bands of bright coal. | 238 | 8 |
| 10 | 10 | Sandstone, white, fine-grained. | 249 | 6 |
| 8 | 9 | Sandstone, grey, cross-bedded. | 258 | 3 |
| | 2 | Shale, black, carbonaceous. | 258 | 5 |
| 23 | 3 | Sandstone, grey, cross-bedded. | 281 | 8 |
| 14 | 10 | Shale, sandy, laminated. | 296 | 6 |
| 126 | 4 | Sandstone, white, medium-grained, with shale bands. | 422 | 10 |

## BORE-HOLE 28 SCHURVEKOPJE 147 ELEVATION 6,380 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 13 | 0 | Soil and shale. | 13 | 0 |
| 16 | 6 | Shale, yellow. | 29 | 6 |
| 20 | 5 | Sandstone, white, medium-grained. | 49 | 11 |
| 13 | 3 | Shale, black. | 63 | 2 |
| 24 | 6 | Sandstone, shaly, cross-bedded, with shale bands. | 87 | 8 |
| | 5 | Coal, shaly banded. | 88 | 1 |
| 9 | 11 | Sandstone, grey, cross-bedded. | 98 | 0 |
| 8 | 4 | Dolerite (Zuinguin). | 106 | 4 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 2 | 4 | Shale, sandy, black. | 108 | 8 |
| 13 | 10 | Sandstone, white, medium-grained. | 122 | 6 |
| 1 | 1 | Shale, black. | 123 | 7 |
| 5 | 4 | Sandstone, white, laminated. | 128 | 11 |
| 262 | 1 | Dolerite (Zuinguin). | 391 | 0 |
| 43 | 6 | Sandstone, grey, cross-bedded. | 434 | 6 |
| 12 | 4 | Shale, sandy, calcareous at base. | 446 | 10 |
| 7 | 7 | Sandstone, white, medium-grained. | 454 | 5 |
| 4 | 11 | Dolerite (Zuinguin). | 459 | 4 |
| 15 | 4 | Sandstone, grey, with shale bands. | 474 | 8 |
| 2 | 5 | Dolerite (Zuinguin). | 477 | 1 |
| 7 | 5 | Sandstone, white, medium-grained. | 484 | 6 |
| 8 | 0 | Dolerite (Zuinguin). | 492 | 6 |
| 17 | 3 | Sandstone, white, gritty. | 509 | 9 |
| | 5 | Dolerite (Zuinguin). | 510 | 2 |
| 13 | 0 | Sandstone, white, gritty. | 523 | 2 |
| 13 | 8 | Sandstone, shaly, banded. | 536 | 10 |
| 17 | 6 | Dolerite (Zuinguin). | 554 | 4 |
| 16 | 6 | Sandstone, grey, fine-grained. | 570 | 10 |
| 2 | 0 | Dolerite (Zuinguin). | 572 | 10 |
| 3 | 8 | Sandstone, white, fine-grained. | 576 | 6 |
| 42 | 6 | Dolerite (Zuinguin). | 619 | 0 |
| 28 | 5 | Sandstone, shaly, grey, banded. | 647 | 5 |
| 9 | 2 | Sandstone, shaly, grey, laminated. | 656 | 7 |
| 56 | 4 | Shale, sandy. | 712 | 11 |
| 1 | 0 | Shale, indurated, calcareous. | 713 | 11 |
| 24 | 6 | Dolerite. | 738 | 5 |
| 141 | 10 | Sandstone, shaly, grey, calcareous. | 880 | 3 |
| 143 | 9 | Shale, sandy, grey, calcareous. | 1024 | 0 |
| 177 | 8 | Dolerite. | 1201 | 8 |
| 35 | 2 | Sandstone, shaly. | 1236 | 10 |
| 24 | 3 | Shale, sandy, black. | 1261 | 1 |
| 11 | 5 | Shale, grey, indurated. | 1272 | 6 |
| 11 | 2 | Sandstone, white, with shale bands. | 1283 | 8 |
| 83 | 11 | Dolerite. | 1367 | 7 |
| 45 | 4 | Sandstone, white, fine-grained. | 1412 | 11 |
| 1 | 9 | Sandstone, white, with a few thin, carbonaceous shale bands. | 1414 | 8 |
| 17 | 8 | Sandstone, white to grey fine-grained, laminated, with shale bands. | 1432 | 4 |
| 16 | 4 | Shale, sandy, laminated. | 1448 | 8 |
| 33 | 11 | Sandstone, grey, laminated, with shale bands. | 1482 | 7 |
| 41 | 5 | Sandstone, grey, cross-bedded. | 1524 | 0 |

B.H.28 (contd.

| Thickness recovered. Ft. | In. | Nature of strata | True depth Ft. | In. |
|---|---|---|---|---|
| 19 | 4 | Sandstone, grey, laminated. | 1543 | 4 |
| 24 | 4 | Sandstone, white, fine-grained. | 1567 | 8 |
| | 4 | Coal, dull, shaly, UPPER ELAND SEAM. | 1568 | 0 |
| 8 | 10 | Sandstone, white, fine-grained. | 1576 | 10 |
| | 8 | Shale, black, carbonaceous. | 1577 | 6 |
| 10 | 11 | Sandstone, grey, with shale bands, and thin bands of coal. | 1588 | 5 |
| | 1 | Coal, bright. LOWER ELAND SEAM. | 1588 | 6 |
| | 2 | Sandstone, grey, medium-grained. | 1588 | 8 |
| | 3 | Coal, bright. LOWER ELAND SEAM. | 1588 | 11 |
| | 5 | Shale, black. | 1589 | 4 |
| | 1 | Coal, bright. LOWER ELAND SEAM. | 1589 | 5 |
| 1 | 5 | Shale, black, and sandstone. | 1590 | 10 |
| 4 | 6 | Sandstone, white, medium-grained. | 1595 | 4 |
| 1 | 5 | Shale, sandy. | 1596 | 9 |
| 73 | 1 | Sandstone, shaly, laminated. | 1669 | 10 |
| 8 | 11 | Sandstone, white, fine-grained. | 1678 | 9 |
| 2 | 9 | Dolerite. | 1681 | 6 |
| | 8 | Sandstone, gritty. | 1682 | 2 |
| 21 | 1 | Sandstone, white to grey, laminated. | 1703 | 3 |
| 4 | 6 | Sandstone, with shale bands. | 1707 | 9 |
| | 2 | Coal, bright. FRITZ SEAM. | 1707 | 11 |
| | 6 | Shale, carbonaceous. | 1708 | 5 |
| | 3 | Coal, bright. FRITZ SEAM. | 1708 | 8 |
| | 6 | Shale, carbonaceous. | 1709 | 2 |
| 20 | 8 | Sandstone, grey, cross-bedded. | 1729 | 10 |
| 4 | 7 | Coal, dull, shaly, merging into carbonaceous shale with some mixed coal. ALFRED (MOSS) SEAM. | 1734 | 5 |
| 30 | 5 | Sandstone, gritty. | 1764 | 10 |
| 2 | 7 | Sandstone, grey, laminated. | 1767 | 5 |
| | 5 | Coal, bright. RIDER SEAM. | 1767 | 10 |
| | 2 | Shale, black. | 1768 | 0 |
| 6 | 4 | Sandstone, grey, laminated. | 1774 | 4 |
| | 7 | Shale, black. | 1774 | 11 |
| 1 | 11 | Sandstone, grey, fine-grained. | 1776 | 10 |
| 3 | 0 | Coal, mainly bright 5 inches dull coal at top. GUS SEAM. | 1779 | 10 |
| 3 | 0 | Shale, sandy. | 1782 | 10 |
| 42 | 8 | Sandstone, white, medium-grained, partly gritty. | 1825 | 6 |
| | 2 | Coal, dull. DUNDAS (YARD) SEAM. | 1825 | 8 |
| 1 | 8 | Sandstone, shaly. | 1827 | 4 |
| 11 | 7 | Sandstone, white, medium-grained. | 1838 | 11 |
| | 8 | Shale, sandy. | 1839 | 7 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| | 3 | Coal, dull. SEAM "Z". | 1839 | 10 |
| | 9 | Shale, black, carbonaceous. | 1840 | 7 |
| | 5 | Coal, bright. | 1841 | 0 |
| 2 | 6 | Shale, sandy. | 1843 | 6 |
| 29 | 10 | Sandstone, grey to white, fine-grained, laminated. | 1873 | 4 |
| | 3 | Sandstone, impregnated with oil. | 1873 | 7 |
| 1 | 9 | Sandstone, fine-grained, with traces of oil. | 1875 | 4 |
| 2 | 9 | Sandstone, grey, laminated. | 1878 | 1 |
| | 2 | Coal, shaly. COKING SEAM. | 1878 | 3 |
| | 11 | Coal, bright. COKING SEAM. | 1879 | 2 |
| | 2 | Shale, carbonaceous. | 1879 | 4 |
| 4 | 8 | Sandstone, grey, laminated. | 1884 | 0 |
| 5 | 10 | Sandstone, white, fine-grained. | 1889 | 10 |
| 8 | 0 | Sandstone, grey, laminated. | 1897 | 10 |
| 2 | 6 | Sandstone, white, fine-grained, with carbonaceous shale bands. | 1900 | 4 |
| 25 | 8 | Sandstone, grey, laminated. | 1926 | 0 |

## BORE-HOLE 29 WELGEVONDEN 93 ELEVATION 4,578 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 16 | 0 | Soil, and weathered sandstone. | 16 | 0 |
| 15 | 8 | Sandstone, dirty grey, shaly, laminated. | 31 | 8 |
| 53 | 11 | Sandstone, with intercalated shale, cross-bedded. | 85 | 7 |
| | 1 | Coal, dull, banded. | 85 | 8 |
| 27 | 1 | Sandstone, white, medium-grained, graded bedding at base. | 112 | 9 |
| 2 | 3 | Shale, sandy, with sandstone laminae. | 115 | 0 |
| 2 | 0 | Coal, shaly, and carbonaceous shale. ALFRED (MOSS) SEAM. | 117 | 0 |
| 40 | 2 | Sandstone, white, medium-grained. | 157 | 2 |
| | 2 | Coal, bright. RIDER SEAM. | 157 | 4 |
| 3 | 11 | Shale, sandy. | 161 | 3 |
| 4 | 9 | Sandstone, white, fine-grained. | 166 | 0 |
| 2 | 7 | Coal, mainly bright, calcitic and pyritic. GUS SEAM. | 168 | 7 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| | 2 | Shale, carbonaceous. | 168 | 9 |
| 48 | 5 | Sandstone, white, medium-grained. | 217 | 2 |
| 1 | 5 | Coal, mainly bright, banded, pyritic. 4 inches grey sandstone in middle of band. DUNDAS (YARD) SEAM. | 218 | 7 |
| | 2 | Shale, carbonaceous. | 218 | 9 |
| 30 | 4 | Sandstone, white, fine-grained. | 249 | 1 |
| | 4 | Coal, bright. SEAM "Z". | 249 | 5 |
| 25 | 10 | Sandstone, white, fine-grained. | 275 | 3 |
| 10 | 4 | Sandstone, shaly, calcitic. | 285 | 7 |
| 1 | 4 | Coal, mainly bright. COKING SEAM. | 286 | 11 |
| 16 | 8 | Sandstone, laminated, calcitic. | 303 | 7 |
| | 8 | Coal, bright, pyritic. TARGAS SEAM. | 304 | 3 |
| 81 | 9 | Sandstone, white, fine-grained. | 386 | 0 |
| 32 | 5 | Sandstone, grey, laminated. | 418 | 5 |
| 3 | 11 | Shale, black, carbonaceous, with coal stringers. | 422 | 4 |
| 11 | 4 | Shale, black, carbonaceous, sandy at base. | 433 | 8 |
| 1 | 2 | Sandstone, white, fine-grained. | 434 | 10 |
| 1 | 10 | Shale, black. | 436 | 8 |
| 15 | 7 | Sandstone, white, fine-grained. | 452 | 3 |

## BORE-HOLE 30 KALKKRANS 313 ELEVATION 5,969 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 4 | 0 | Soil, boulders. | 4 | 0 |
| 9 | 5 | Shale, blue-black, indurated. | 13 | 5 |
| 3 | 0 | Sandstone, white, fine-grained. | 16 | 5 |
| 4 | 4 | Shale, grey. | 20 | 9 |
| 6 | 0 | Sandstone, white, fine-grained. | 26 | 9 |
| 1 | 0 | Dolerite (Zuinguin). | 27 | 9 |
| 56 | 11 | Sandstone, white, fine- to medium-grained, only a few inches impregnated with oil. | 84 | 8 |
| 15 | 6 | Sandstone, shaly, with shale bands. | 100 | 2 |
| 6 | 2 | Shale, sandy. | 106 | 4 |
| 3 | 2 | Sandstone, white, medium-grained. | 109 | 6 |
| 10 | 0 | Shale, sandy, 2 feet indurated shale at bottom. | 119 | 6 |
| 2 | 6 | Sandstone, grey, fine-grained. | 122 | 0 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 3 | 2 | Shale, black. | 125 | 2 |
| 95 | 10 | Sandstone, white, medium- to coarse-grained. | 221 | 0 |
| 15 | 6 | Sandstone, grey, cross-bedded. | 236 | 6 |
| 10 | 11 | Sandstone, white, fine-grained. | 247 | 5 |
| 35 | 0 | Sandstone, grey, cross-bedded. | 282 | 5 |
| 10 | 10 | Sandstone, grey, laminated. | 293 | 3 |
| 235 | 9 | Shale, sandy, grey. | 529 | 0 |
| 2 | 9 | Dolerite. | 531 | 9 |
| 80 | 4 | Shale, sandy, grey. | 612 | 1 |
| 8 | 6 | Dolerite. | 620 | 7 |
| 84 | 8 | Shale, sandy, grey. | 705 | 3 |
| 11 | 2 | Sandstone, grey, cross-bedded, calcareous. | 716 | 5 |
| 163 | 5 | Dolerite. | 879 | 10 |
| 62 | 9 | Shale, sandy, 4 inches indurated shale at top. | 942 | 7 |
| 12 | 1 | Sandstone, grey, cross-bedded. | 954 | 8 |
| 28 | 3 | Sandstone, white, fine-grained. | 982 | 11 |
| 128 | 6 | Dolerite. | 1111 | 5 |
| 10 | 0 | Sandstone, grey, laminated. | 1121 | 5 |
| 2 | 7 | Dolerite. | 1124 | 0 |
| 17 | 0 | Sandstone, grey, laminated, with shale bands. | 1141 | 0 |
| 24 | 10 | Sandstone, shaly, laminated. | 1165 | 10 |
| 11 | 10 | Sandstone, grey, cross-bedded. | 1177 | 8 |
| 1 | 3 | Shale, black. | 1178 | 11 |
| 29 | 5 | Sandstone, grey, laminated, with shale bands. | 1208 | 4 |
| 5 | 11 | Sandstone, white, fine-grained. | 1214 | 3 |
| 41 | 5 | Sandstone, grey, cross-bedded. | 1255 | 8 |
| 22 | 7 | Sandstone, white, coarse-grained. | 1278 | 3 |
| 1 | 0 | Coal, mixed, carbonaceous shale, and 1 inch sandy shale at bottom. ELAND SEAM. | 1279 | 3 |
| | 8 | Shale, black, carbonaceous. | 1279 | 11 |
| 2 | 4 | Sandstone, grey, cross-bedded, shaly, with a coal stringer. | 1282 | 3 |
| 59 | 1 | Sandstone, white, medium-grained, coarse-grained at base. | 1341 | 4 |
| 3 | 8 | Sandstone, grey, laminated. | 1345 | 0 |
| 70 | 0 | Sandstone, grey, with shale bands. | 1415 | 0 |
| | 9 | Coal, bright, slightly shaly at top and bottom. FRITZ SEAM. | 1415 | 9 |

B.H.30 (contd.)

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| | 7 | Shale, black, carbonaceous. | 1416 | 4 |
| 13 | 4 | Sandstone, white, medium-grained. | 1429 | 8 |
| 4 | 10 | Coal, dull, with occasional bright coal stringers, brighter coal towards bottom. ALFRED (MOSS) SEAM. | 1434 | 6 |
| | 5 | Sandstone, shaly. | 1434 | 11 |
| 28 | 11 | Sandstone, white, medium-grained. | 1463 | 10 |
| | 1 | Coal, bright. RIDER SEAM. | 1463 | 11 |
| | 4 | Sandstone, white, fine-grained. | 1464 | 3 |
| | 1 | Coal, bright. RIDER SEAM. | 1464 | 4 |
| | 7 | Shale, black. | 1464 | 11 |
| 7 | 4 | Sandstone, grey, 3 feet black shale at bottom. | 1472 | 3 |
| 4 | 10 | Sandstone, gritty. | 1477 | 1 |
| 2 | 9 | Coal, mainly bright, dull at top. GUS SEAM. | 1479 | 10 |
| 11 | 4 | Sandstone, white, medium-grained. | 1491 | 2 |
| 12 | 5 | Sandstone, shaly, cross-bedded. | 1503 | 7 |
| 41 | 10 | Sandstone, white, coarse-grained. | 1545 | 5 |
| 1 | 2 | Coal, bright. DUNDAS (YARD) SEAM. | 1546 | 7 |
| 28 | 2 | Sandstone, grey, laminated. | 1574 | 9 |
| 17 | 1 | Sandstone, white, fine-grained. | 1591 | 10 |
| | 6 | Coal, bright and dull. COKING SEAM. | 1592 | 4 |
| 6 | 9 | Sandstone, grey, cross-bedded. | 1599 | 1 |

## BORE-HOLE 31 JERICHO 198 ELEVATION 6,353 FT.

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 8 | 0 | Soil and clay. | 8 | 0 |
| 40 | 6 | Shale, indurated | 48 | 6 |
| | 6 | Dolerite. | 49 | 0 |
| 67 | 5 | Shale, indurated. | 116 | 5 |
| 4 | 1 | Dolerite. | 120 | 6 |
| 42 | 10 | Shale, sandy, indurated. | 163 | 4 |
| 33 | 0 | Shale, indurated. | 196 | 4 |
| 4 | 0 | Dolerite. | 200 | 4 |
| 85 | 8 | Shale, indurated. | 286 | 0 |
| 280 | 9 | Dolerite. | 566 | 9 |
| 20 | 4 | Shale, indurated. | 587 | 1 |
| 19 | 9 | Sandstone, shaly. | 606 | 10 |
| 13 | 10 | Dolerite. | 620 | 8 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 12 | 5 | Shale, sandy, indurated. | 633 | 1 |
| 331 | 6 | Dolerite. | 964 | 7 |
| 6 | 10 | Shale, blue, calcareous, indurated. | 971 | 5 |
| 22 | 3 | Dolerite. | 993 | 8 |
| 46 | 7 | Shale, indurated. | 1040 | 3 |
| 13 | 0 | Sandstone, grey, fine-grained, current-bedded. | 1053 | 3 |
| 43 | 11 | Sandstone, white, fine-grained. | 1097 | 2 |
| 11 | 10 | Sandstone, grey, laminated, with thin shale bands. | 1109 | 0 |
| 17 | 10 | Shale, black, with sandstone bands. | 1126 | 10 |
| 16 | 6 | Sandstone, grey, cross-bedded. | 1143 | 4 |
| 29 | 0 | Sandstone, grey, laminated with thin shale bands. | 1172 | 4 |
| 143 | 0 | Dolerite. | 1315 | 4 |
| 1 | 9 | Sandstone, white, fine-grained. | 1317 | 1 |
| 1 | 1 | Shale, sandy. | 1318 | 2 |
| 48 | 4 | Sandstone, grey, cross-bedded. | 1366 | 6 |
| 1 | 3 | Sandstone, white, graded bedding at bottom. | 1367 | 9 |
| | 0½ | Shale, black, indurated. | 1367 | 9½ |
| 1 | 0½ | Dolerite. | 1368 | 10 |
| 1 | 6 | Shale, carbonaceous. | 1370 | 4 |
| 16 | 1 | Sandstone, white, medium-grained. | 1386 | 5 |
| | 7 | Coal, dull, shaly. UPPER ELAND SEAM. | 1387 | 0 |
| 3 | 4 | Sandstone, grey, fine-grained. | 1390 | 4 |
| | 2 | Shale, carbonaceous. | 1390 | 6 |
| 7 | 7 | Sandstone, fine-grained, with thin shale bands. | 1398 | 1 |
| | 5 | Coal, dull, shaly. LOWER ELAND SEAM. | 1398 | 6 |
| 1 | 7 | Shale, sandy. | 1400 | 1 |
| 24 | 3 | Sandstone, grey, medium-grained. | 1424 | 4 |
| | 8 | Shale, black. | 1425 | 0 |
| 6 | 3 | Sandstone, white, fine-grained. | 1431 | 3 |
| 20 | 9 | Sandstone, grey, laminated. | 1452 | 0 |
| 38 | 0 | Sandstone, grey, laminated, with shale bands. | 1490 | 0 |
| 4 | 2 | Sandstone, white, fine-grained. | 1494 | 2 |
| 12 | 8 | Sandstone, grey, laminated, calcareous, with shale bands. | 1506 | 10 |
| 5 | 1 | Sandstone, white, fine-grained. | 1511 | 11 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| | 9 | Coal, bright. FRITZ SEAM. | 1512 | 8 |
| 1 | 3 | Shale, sandy, black. | 1513 | 11 |
| 13 | 10 | Sandstone, white, medium-grained. | 1527 | 9 |
| 1 | 4 | Sandstone, shaly, laminated. | 1529 | 1 |
| 4 | 3 | Coal, dull, shaly, 9 inches very bright coal at base. ALFRED (MOSS) SEAM. | 1533 | 4 |
| 5 | 0 | Sandstone, grey, medium-grained. | 1538 | 4 |
| 16 | 4 | Sandstone, white, medium- to coarse-grained. | 1554 | 8 |
| | 1 | Coal, dull, shaly. RIDER SEAM. | 1554 | 9 |
| | 6 | Sandstone, grey, fine-grained. | 1555 | 3 |
| 2 | 2 | Shale, sandy, laminated. | 1557 | 5 |
| 4 | 0 | Sandstone, white, fine-grained. | 1561 | 5 |
| 1 | 2 | Shale, black. | 1562 | 7 |
| 2 | 11 | Sandstone, grey, laminated. | 1565 | 6 |
| | 9 | Shale, carbonaceous. | 1566 | 3 |
| 3 | 5 | Sandstone, grey, laminated. | 1569 | 8 |
| 1 | 1 | Coal, dull, shaly, with 2 inches cross-bedded sandstone at top. GUS SEAM. | 1570 | 9 |
| 34 | 3 | Sandstone, grey to white, medium-grained. | 1605 | 0 |
| 10 | 10 | Sandstone, gritty, medium-grained, sandstone at bottom. | 1615 | 10 |
| | 5 | Coal, bright. DUNDAS (YARD) SEAM. | 1616 | 3 |
| 1 | 4 | Sandstone, grey, laminated. | 1617 | 7 |
| | 4 | Coal, bright. DUNDAS (YARD) SEAM. | 1617 | 11 |
| 1 | 3 | Sandstone, grey, laminated. | 1619 | 2 |
| | 1 | Coal, bright. DUNDAS (YARD) SEAM. | 1619 | 3 |
| 5 | 2 | Sandstone, grey, fine-grained. | 1624 | 5 |
| 1 | 5 | Shale, carbonaceous, black. | 1625 | 10 |
| | 2 | Coal, bright. DUNDAS (YARD) SEAM. | 1626 | 0 |
| | 5 | Shale, sandy, black. | 1626 | 5 |
| 14 | 9 | Sandstone, grey. | 1641 | 2 |
| 5 | 0 | Shale, indurated, calcareous. | 1646 | 2 |
| 10 | 8 | Sandstone, grey, laminated, with shale bands. | 1656 | 10 |
| 19 | 5 | Sandstone, white, medium-grained. | 1676 | 3 |
| | 2 | Shale, sandy. | 1676 | 5 |
| 1 | 5 | Sandstone, white, fine-grained. | 1677 | 10 |
| | 10 | Shale, sandy, carbonaceous. | 1678 | 8 |
| 2 | 0 | Coal, bright, carbonaceous shale at top. COKING SEAM. | 1680 | 8 |
| 1 | 5 | Shale, carbonaceous, with thin sandstone bands. | 1682 | 1 |

| Thickness recovered | | Nature of strata | True depth | |
|---|---|---|---|---|
| Ft. | In. | | Ft. | In. |
| 4 | 5 | Sandstone, dirty grey, fine-grained. | 1686 | 6 |
| | 1 | Coal, bright. | 1686 | 7 |
| 55 | 2 | Sandstone, grey, laminated. | 1741 | 9 |
| 4 | 0 | Sandstone, calcareous. | 1745 | 9 |
| 9 | 3 | Sandstone, grey, partly calcareous. | 1755 | 0 |
| 11 | 6 | Sandstone, grey, with thin shale bands. | 1766 | 6 |
| | 7 | Shale, black, calcareous. | 1767 | 1 |
| 11 | 2 | Shale, black. | 1778 | 3 |

## TABLE 1

## DESCRIPTION OF SAMPLES

| Bore-hole | Depth Ft. | Depth In. | Sample No. | Thick-ness In. | Description |
|---|---|---|---|---|---|
| A. Eland Seam | | | | | |
| 14 | 40 | 1 | 55/429 B | 6 | Mixed coal, bright at top, dull at bottom. |
| | 40 | 7 | | | |
| 23 | 1,002 | 10 | 58/242 A | 3 | Very bright coal. |
| | | | | 4 | Dull coal, shaly in bottom inch. |
| | 1,003 | 8 | | 3 | Bright coal and carbonaceous shale. |
| 24 | 776 | 6 | 57/779 A | 1 | Bright coal. |
| | | | | 1 | Dull shaly coal. |
| | 777 | 1 | | 5 | Bright coal, calcitic. |
| 30 | 1,278 | 4 | 58/320 A | 3½ | Carbonaceous shale. Not Sampled. |
| | | | | 5½ | Mixed coal, pyritic. |
| | 1,279 | 2 | | 1 | Sandy shale. Not Sample |
| B. Fritz Seam | | | | | |
| 19 | 356 | 4 | 56/561 A | 4 | Dull coal. |
| | | | | 6 | Finely banded bright coal, calcitic in cleats, pyritic. |
| | 357 | 2 | | | |
| 30 | 1,415 | 0 | 58/321 A | 9 | Bright coal, slightly shaly at top and bottom. |
| | 1,415 | 9 | | | |
| 31 | 1,511 | 11 | 58/778 A | 7 | Mainly bright coal. NOTE: 2" of core lost. |
| | 1,512 | 8 | | | |
| C. Alfred Seam | | | | | |
| 1 | 602 | 8 | | 11½ | Carbonaceous shale. Not Sampled. |
| | 604 | 11 | 54/415 A | 15½ | Dull, mainly shaly coal. |

TABLE 1 (Contd.)

| Bore-hole | Depth Ft. | Depth In. | Sample No. | Thickness In. | Description |
|---|---|---|---|---|---|
| | | | | | C. Alfred Seam (Contd.) |
| 2 | 758 | 4 | 52/668 A | 27 | Dull inferior coal with a 1-inch shale band near top and a 2-inch mixed coal band near bottom. |
| | 760 | 7 | | | |
| 3 | 873 | 4 | 53/213 A | 26 | Dull non-banded coal with three ½-inch shaly coal bands. |
| | 875 | 6 | | | |
| 5 | 966 | 10 | | 29 | Carbonaceous shale with a 4-inch dull coal band near top. Not Sampled. |
| | | | 55/254 E | 4 | Mixed coal, shaly at top. |
| | 969 | 10 | | 3 | Carbonaceous sandy shale. Not Sampled. |
| 9 | 1,152 | 7 | 54/185 A | 32 | Dull granular coal with a few thin shale bands. |
| | 1,155 | 7 | | 4 | Mixed shale and coal. |
| 14 | 185 | 5 | 55/429 A | 2 | Dull shaly coal. |
| | | | | ¾ | Carbonaceous shale. |
| | | | | ¼ | Pyrite. |
| | | | | 24 | Dull coal, shaly in parts. |
| | 187 | 8 | | | |
| 19 | 388 | 7 | 56/562 A | 2 | Bright coal. |
| | | | | 13 | Dull shaly coal. |
| | | | | 8 | Mixed, mainly dull coal. |
| | 391 | 3 | | 9 | Dull shaly coal with a few sandstone stringers. |
| 20 | 117 | 7 | 56/639 B | 44 | Dull coal, shaly in parts. |
| | | | | 8 | Sandstone and carbonaceous shale. Not Sampled. |
| | 122 | 6 | A | 7 | Dull coal with a few bright stringers. |
| 21 | 859 | 8 | | 1 | Sandstone and grit. Not Sampled. |
| | | | 57/486 A | 39 | Dull shaly coal with occasional shale bands and thin bright stringers. |
| | 863 | 0 | | | |

TABLE 1 (Contd.)

| Bore-hole | Depth Ft. | In. | Sample No. | Thickness In. | Description |
|---|---|---|---|---|---|
| C. Alfred Seam (Contd.) | | | | | |
| 22 | 832 | 1 | 57/741 A | 24 | Dull shaly coal with carbonaceous shale bands. |
| | 834 | 5 | | 4 | Carbonaceous shale. Not Sampled. |
| 23 | 1,178 | 8 | 58/243 A | 26 | Dull shaly coal with carbonaceous shale bands. |
| | 1,180 | 10 | | | |
| 24 | 926 | 11 | | 5 | Bright coal with a 1-inch sandy shale band. |
| | 930 | 1 | 57/780 A | 33 | Dull coal, shaly in parts. |
| 25 | 1,010 | 6 | 57/548 A | 1½<br>7½<br>4 | Mixed coal.<br>Shale and coal.<br>Dull coal. |
| | 1,011 | 7 | | | |
| 26 | 1,083 | 4 | | 1½ | Pyritic sandy shale. Not Sampled. |
| | 1,085 | 6 | 58/123 C | 20½ | Dull, mainly shaly coal. |
| 28 | 1,729 | 10 | 58/602 A | 50 | Dull shaly coal merging into carbonaceous shale with some mixed coal. Core broken in top half. NOTE: 5" of core lost |
| | 1,734 | 5 | | | |
| 29 | 115 | 0 | 58/326 A | 20 | Carbonaceous shale and shaly coal. NOTE: 4" of core lost. |
| | 117 | 0 | | | |
| 30 | 1,429 | 8 | 58/322 B | 35 | Dull, mainly shaly coal with occasional bright coal stringers. |
| | 1,434 | 6 | A | 23 | Mixed mainly dull coal, brighter towards bottom. |

TABLE 1 (Contd.)

| Bore-hole | Depth Ft. | In. | Sample No. | Thickness In. | Description |
|---|---|---|---|---|---|
| C. Alfred Seam (Contd.) | | | | | |
| 31 | 1,529 | 1 | 58/779 B | 23 | Dull shaly coal with occasional bright coal stringers. |
| | | | | 13 | Mixed and dull coal with a 1½-inch shaly coal band in middle. |
| | | | A | 6 | Mixed bright and dull coal, calcitic. |
| | 1,533 | 4 | | 9 | Very bright coal, calcitic. |
| D. Rider Seam | | | | | |
| 9 | 1,178 | 1 | | 7 | Bright coal. |
| | | | 54/186 A | 3½ | Dull granular coal. |
| | 1,179 | 5 | | 5½ | Bright coal. |
| 20 | 135 | 5 | | 2½ | Carbonaceous shale. Not Sampled. |
| | 136 | 4 | 56/640 A | 8½ | Bright coal, slightly calcitic. |
| 24 | 963 | 10 | 57/781 A | 12 | Mixed mainly bright coal with a ¼-inch sandstone band 4" from top. |
| | 964 | 10 | | | |
| 26 | 1,128 | 8 | 58/123 B | 6 | Bright coal, pyritic. |
| | | | | 29 | Carbonaceous shale. Not Sampled. |
| | 1,132 | 4 | A | 9 | Bright coal, calcitic. |
| E. Upper Gus or Gus Seam | | | | | |
| 1 | 667 | 2 | | 4½ | Dull coal. |
| | | | 54/416 A | 13 | Mixed mainly dull coal. |
| | | | | 14½ | Bright coal.<br>NOTE: 1" of core lost. |
| | 669 | 11 | | | |

TABLE 1 (Contd.)

| Bore-hole | Depth | | Sample No. | Thick-ness In. | Description |
|---|---|---|---|---|---|
| | Ft. | In. | | | |
| | | | | | E. Upper Gus or Gus Seam (Contd.) |
| 2 | 826<br>829 | 8<br>1 | 52/669 A | 25½ | Mixed bright and dull coal, finely banded. |
| 3 | 947 | 5 | 53/214 A | 31 | Very bright coal, slightly less bright in top 12". |
| | 950 | 0 | | | |
| 5 | 1,013 | 9 | 55/254 D | 14 | Mainly bright coal, pyritic. Core broken.<br>NOTE: 5" of core lost. |
| | 1,015 | 4 | | | |
| 6 | 802 | 3 | | 6 | Shale and coal. Not Sampled. |
| | | | 53/589 A | 27 | Mixed mainly dull coal, brighter in bottom 7".<br>NOTE: 3" of core lost. |
| | 805 | 0 | | | |
| 7 | 826 | 9 | 55/147 A | 21 | Mixed, mainly dull lustrous coal with occasional thin carbonaceous shale bands |
| | 828 | 6 | | | |
| 8 | 1,363<br>1,364 | 7<br>8 | 53/699 A | 13 | Bright coal. |
| 9 | 1,212 | 7 | | 10½ | Mixed, mainly dull coal. |
| | | | 54/187 A | 23½ | Alternating bands of dull granular and bright coal. |
| | 1,216 | 6 | | 13 | Bright coal. |
| 14 | 265 | 5 | 55/430 A | 31 | Bright coal with a 2-inch dull shaly coal band 2" from bottom.<br>NOTE: 1" of core lost |
| | 268 | 1 | | | |
| 15 | 202 | 9 | 55/426 A | 23 | Mainly bright coal, highly pyritic at top.<br>NOTE: 2" of core lost |
| | 204 | 10 | | | |
| 16 | 582<br>586 | 9<br>0 | 55/669 A | 39 | Mixed mainly bright coal, pyritic at top. |

TABLE 1 (Contd.)

E. Upper Gus or Gus Seam (Contd.)

| Bore-hole | Depth Ft. | In. | Sample No. | Thick-ness In. | Description |
|---|---|---|---|---|---|
| 19 | 440 | 0 | 56/563 B | 24 | Alternating bands of dull and bright coal - a 2-inch sandstone band 9" from top excluded. |
| | | | A | 32 | Mixed mainly bright coal. |
| | 444 | 9 | | 1 | Carbonaceous shale. Not Sampled. |
| 20 | 150 | 11 | 56/641 A | 23 | Mainly bright coal, pyritic and calcitic in cleats. |
| | 152 | 10 | | | |
| 21 | 922 | 7 | 57/487 A | 24 | Mixed mainly dull lustrous coal grading into finely banded bright coal. |
| | 924 | 8 | | 1 | Shale. Not Sampled. |
| 23 | 1,235 | 7 | | 4½ | Dull shaly coal. Not Sampled. |
| | | | 58/244 A | 14½ | Alternating bands of bright and dull granular coal, pyritic. |
| | 1,237 | 2 | | | |
| 24 | 990 | 4 | | 1½ | Bright coal. Not Sampled. |
| | | | | 2½ | Sandstone. Not Sampled. |
| | | | 57/782 B | 9 | Mainly dull coal, shaly in parts. |
| | | | | 1½ | Sandstone and shale. Not Sampled. |
| | | | A | 16½ | Alternating bands of dull and bright coal. |
| | | | | 15 | Bright coal, calcitic and pyritic. |
| | 994 | 2 | | | |
| 25 | 1,075 | 10 | | 4 | Mixed coal. |
| | | | 57/549 A | 5 | Dull coal with bright stringers. |
| | | | | 25 | Mixed coal, brighter towards bottom. |
| | 1,078 | 8 | | | |
| 27 | 23 | 9 | 58/388 A | 48 | Mainly bright, weathered coal, pyritic and yellow stained. |
| | 27 | 9 | | | |
| 28 | 1,776 | 10 | 58/603 A | 5 | Dull coal. |
| | 1,779 | 10 | | 31 | Mainly bright coal. |

TABLE 1 (Contd.)

| Bore-hole | Depth Ft. | Depth In. | Sample No. | Thickness In. | Description |
|---|---|---|---|---|---|
| E. Upper Gus or Gus Seam (Contd.) | | | | | |
| 29 | 166 | 0 | 58/327 A | 28 | Mainly bright coal, calcitic and pyritic. |
| | 168 | 7 | | | NOTE: 3" of core lost |
| 30 | 1,477 | 1 | 58/323 A | 12 | Mainly dull coal. |
| | | | | 20 | Bright coal, pyritic. |
| | 1,479 | 10 | | 1 | Shale. Not Sampled. |
| 31 | 1,569 | 11 | 58/780 A | 9 | Mainly bright coal. |
| | 1,570 | 9 | | | NOTE: 1" of core lost |
| F. Lower Gus Seam | | | | | |
| 3 | 959 | 7 | | 20 | Alternating bands of bright and dull coal. |
| | | | 53/215 A | ½ | Sandstone. Excluded. |
| | | | | 7 | Dull coal. |
| | 962 | 7 | | 8½ | Bright coal. |
| 8 | 1,385 | 9 | 53/700 A | 34 | Mixed mainly bright co |
| | 1,388 | 7 | | | |
| 9 | 1,228 | 8 | | 27½ | Bright coal with occasional dull coal band |
| | | | 54/188 A | 5½ | Mainly bright coal - core badly broken. |
| | 1,231 | 8 | | | NOTE: 3" of core lost |
| 14 | 298 | 7 | 55/431 A | 10 | Mixed mainly bright coal. |
| | 299 | 5 | | | |
| 23 | 1,250 | 11 | 58/245 A | 15 | Dull heavy coal with a few bright coal bands |
| | 1,252 | 5 | | | NOTE: 3" of core lost |
| 24 | 1,002 | 2 | 57/783 B | 25 | Dull coal with some bright coal in middle |
| | | | | 16 | Mixed coal. |
| | | | A | 5 | Dull coal. |
| | | | | 10 | Mainly bright coal. |
| | 1,007 | 0 | | 2 | Carbonaceous shale. No Sampled. |
| 26 | 1,142 | 7 | 58/124 C | 31 | Dull coal with a few bright coal bands. |
| | 1,146 | 0 | | 10 | Mainly bright coal, ca citic. |

TABLE 1 (Contd.)

| Bore-hole | Depth Ft. | In. | Sample No. | Thick-ness In. | Description |
|---|---|---|---|---|---|
| | | | G. Dundas Seam | | |
| 1 | 721 | 10 | 54/417 A | 40 | Finely banded bright coal with occasional thin carbonaceous shale and pyritic bands. |
| | 725 | 2 | | | |
| 2 | 882 | 0 | 52/670 B | 22½ | Mainly bright coal with thin shale bands in bottom 9". |
| | | | | 2½ | Carbonaceous shale. Not Sampled. |
| | | | | 4 | Bright coal with thin shale bands. |
| | | | A | 3½ | Carbonaceous shale with coal stringers. |
| | | | | 1½ | Bright coal. |
| | | | | 2 | Carbonaceous shale. Not Sampled. |
| | 885 | 0 | | | |
| 3 | 992 | 5½ | | 7 | Dull coal with sandstone lenses. |
| | | | | 23½ | Bright coal. |
| | | | 53/219 B | 2 | Dull shaly coal. |
| | | | | 2½ | Sandstone. Excluded. |
| | | | | 7 | Bright coal. |
| | | | | 6 | Shale. Not Sampled. |
| | 997 | 2 | A | 8½ | Bright coal with thin shaly bands. |
| 5 | 1,062 | 4 | 55/254 C | 13 | Mainly bright coal with a few shale bands. |
| | | | | 41 | Sandstone and shale. Not Sampled. |
| | 1,067 | 5 | B | 7 | Mainly bright granular coal. |
| 6 | 851 | 0 | 53/590 A | 14½ | Bright coal with a burnt appearance. |
| | 852 | 2½ | | | |
| 7 | 879 | 10 | 55/148 B | 27 | Mainly bright coal with a slip-plane in middle. |
| | | | | 30 | Banded sandstone and shale. Not Sampled. |
| | | | A | 7 | Mainly bright coal with shale stringers. |
| | 852 | 2 | | | |

TABLE 1 (Contd.)

G. Dundas Seam (Contd.)

| Bore-hole | Depth | | Sample No. | Thickness In. | Description |
|---|---|---|---|---|---|
| | Ft. | In. | | | |
| 8 | 1,411 | 4 | 53/701 A | 29 | Bright coal with two ¼-inch to ¾-inch shale bands. |
| | 1,413 | 9 | | | |
| 9 | 1,256 | 2 | | 33 | Bright coal. |
| | | | 54/212 A | ½ | Shaly coal. |
| | 1,259 | 7½ | | 8 | Bright banded coal with a few thin shaly bands. |
| 14 | 312 | 4 | 55/432 A | 34 | Bright banded coal, slightly pyritic. |
| | 315 | 2 | | | |
| 15 | 254 | 10 | 55/427 A | 10 | Mainly bright coal, pyritic at bottom. |
| | 255 | 10 | | 2 | Dull shaly coal. Not Sampled. |
| 25 | 1,119 | 3½ | | 17 | Mixed mainly bright coal. |
| | | | 57/551 A | 4 | Dull coal. |
| | 1,121 | 3½ | | 3 | Mixed coal. |
| 26 | 1,184 | 9 | 58/124 A | 30 | Bright coal with a 3-inch dull coal band 2" from top, slightly pyritic. |
| | | | | 13 | Sandstone with coal stringers. Not Sampled. |
| | | | | 1 | Bright coal. Not Sampled. |
| | | | | 4 | Sandstone. Not Sampled. |
| | 1,189 | 6 | 58/125 B | 9 | Bright coal with a few thin shale bands, pyritic. |
| 29 | 217 | 2 | | 4 | Bright banded coal, pyritic. |
| | | | 58/328 A | 1 | Carbonaceous shale. Excluded. |
| | | | | 4 | Sandstone. Excluded. |
| | 218 | 7 | | 8 | Mainly bright coal. |
| 30 | 1,545 | 5 | 58/324 A | 12 | Bright coal. |
| | 1,546 | 7 | | 2 | Shale. Not Sampled. |

TABLE 1 (Contd.)

| Bore-hole | Depth Ft. | In. | Sample No. | Thick-ness In. | Description |
|---|---|---|---|---|---|
| H. Seam "Z" | | | | | |
| 25 | 1,162<br>1,162 | 0<br>10 | 57/742 A | 6 | Bright banded coal, calcitic.<br>NOTE: 4" of core lost. |
| I. Coking Seam | | | | | |
| 2 | 929 | 0 | 52/777 A | 2 | Dull coal. |
| | 930 | 1½ | | 11½ | Bright coal. |
| 3 | 1,040 | 11 | | 3 | Bright coal. |
| | | | 53/272 A | 2 | Dull coal. |
| | 1,043 | 3 | | 23 | Finely banded bright coal. |
| 5 | 1,115<br>1,116 | 4<br>0 | 55/254 A | 8 | Bright banded coal with a burnt appearance. |
| 6 | 919<br>920 | 8<br>7 | 53/660 A | 11 | Bright banded coal with a burnt appearance. |
| 7 | 944<br>945 | 0<br>6 | 55/149 A | 18 | Mainly bright coal with a burnt appearance. |
| 8 | 1,474<br>1,475 | 2<br>5 | 53/732 A | 15 | Bright banded coal. |
| 14 | 376 | 0 | | 3 | Bright coal. |
| | | | 55/433 A | 2 | Pyritic sandy shale. Excluded. |
| | 377 | 5 | | 12 | Bright coal. |
| 15 | 312<br>313 | 0<br>9 | 55/428 A | 21 | Mainly bright coal, granular in parts. |
| 16 | 700<br>702 | 3<br>3 | 55/670 | 24 | Bright banded coal, pyritic. |
| 25 | 1,181<br>1,183 | 9<br>3 | 57/743 A | 18 | Bright banded coal. |
| 26 | 1,236<br>1,238 | 11<br>11 | 58/125 A | 24 | Bright banded coal, pyritic. |

TABLE 1 (Contd.)

| Bore-hole | Depth Ft. | In. | Sample No. | Thick-ness In. | Description |
|---|---|---|---|---|---|
| I. Coking Seam (Contd.) | | | | | |
| 27 | 151 | 11 | 58/389 A | 13 | Bright banded coal, pyritic. |
| | 153 | 0 | | | |
| 28 | 1,878 | 3 | 58/604 A | 11 | Bright banded coal. |
| | 1,879 | 2 | | | |
| 29 | 285 | 7 | 58/329 A | 16 | Mainly bright banded coal. |
| | 286 | 11 | | | |
| 30 | 1,591 | 10 | 58/325 A | 6 | Mixed bright and dull coal. |
| | 1,592 | 4 | | | |
| 31 | 1,678 | 8 | | 1½ | Carbonaceous shale. Not Sampled. |
| | | | 58/781 A | 20½ | Bright coal with a few shale stringers. NOTE: 3" of core lost. |
| | 1,680 | 8 | | | |
| J. Targas Seam | | | | | |
| 29 | 303 | 7 | 58/330 A | 8 | Bright banded coal, pyritic. |
| | 304 | 3 | | | |
| K. Uncorrelated Seam | | | | | |
| 25 | 1,105 | 9 | 57/550 A | 5 | Mixed bright and dull coal. |
| | 1,106 | 2 | | | |
| 26 | 1,161 | 8 | 58/124 B | 13 | Bright banded coal. |

## TABLE 2

## ANALYSIS OF SAMPLES

### A. Eland Seam

| Bore-hole | Sample No. | Thickness (in.) | | | Analysis of raw coal (air-dry basis) | | | | | | | Analysis of floats of 1½-in. coal (air-dry basis) | | | | | | | | | Sink | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Exc. | Sam-pled | Core loss | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | Sw. No. | S % | S.G. | Yield % | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | S.W. No. | S. % | Yield % | Ash % |
| 14 | 55/429B | - | 6 | - | - | 1.4 | 15.4 | 9.2 | 74.0 | - | - | | | | | | | | | | | |
| 23 | 58/242A | - | 10 | - | - | 1.1 | 26.5 | 16.6 | 55.8 | - | - | | | | | | | | | | | |
| 24 | 57/779A | - | 7 | - | - | 1.4 | 19.3 | 23.8 | 55.5 | 4 | - | | | | | | | | | | | |
| 30 | 58/320A | - | 5½ | - | - | 1.9 | 13.3 | 31.3 | 53.5 | 3 | - | | | | | | | | | | | |

### B. Fritz Seam

| Bore-hole | Sample No. | Exc. | Sam-pled | Core loss | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | Sw. No. | S % | S.G. | Yield % | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | S.W. No. | S. % | Yield % | Ash % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | 56/561A | - | 10 | - | - | 2.1 | 13.1 | 30.3 | 54.5 | ½ | - | | | | | | | | | | | |
| 30 | 58/321A | - | 9 | - | - | 1.9 | 26.2 | 30.3 | 41.6 | 1 | - | | | | | | | | | | | |
| 31 | 58/778A | - | 7 | 2 | - | 1.6 | 18.5 | 29.9 | 50.0 | 2½ | - | | | | | | | | | | | |

### C. Alfred Seam

| Bore-hole | Sample No. | Exc. | Sam-pled | Core loss | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | Sw. No. | S % | S.G. | Yield % | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | S.W. No. | S. % | Yield % | Ash % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 54/415A | - | 15½ | - | - | 2.7 | 31.9 | 13.6 | 51.8 | 0 | 1.0 | 1.50 | 9.1 | - | - | - | - | - | - | - | 90.9 | - |
| 2 | 52/668A | - | 27 | - | 10.6 | 1.4 | 29.3 | 6.2 | 63.1 | - | - | | | | | | | | | | | |
| 3 | 53/213A | - | 26 | - | - | 1.8 | 34.3 | 15.4 | 48.5 | - | - | 1.50 | 0.4 | - | - | - | - | - | - | - | 99.6 | - |
| 5 | 55/254E | - | 4 | - | - | 1.6 | 21.9 | 6.3 | 70.2 | - | - | | | | | | | | | | | |
| 9 | 54/185A | - | 36 | - | - | 2.3 | 36.5 | 15.6 | 45.6 | ½ | - | 1.50 | 3.0 | - | - | - | - | - | - | - | 97.0 | - |
| 14 | 55/429A | - | 27 | - | - | 1.4 | 31.2 | 6.5 | 60.9 | - | - | 1.50 | 0.9 | - | - | - | - | - | - | - | 99.1 | - |
| 19 | 56/562A | - | 32 | - | - | - | 43.1 | - | - | - | - | 1.58 | 23.4 | - | - | - | - | - | - | - | 76.6 | - |
| 20 | 56/639B | - | 44 | - | - | 3.1 | 34.0 | 18.1 | 44.8 | 0 | - | 1.58 | 34.4 | - | - | - | - | - | - | - | 65.6 | - |
| | | 8 | | | | | | | | | | | | | | | | | | | | |
| | A | - | 7 | - | - | 2.5 | 32.5 | 20.6 | 44.4 | 0 | - | 1.58 | 40.5 | - | - | - | - | - | - | - | 59.5 | - |
| 21 | 57/486A | - | 39 | - | - | 2.0 | 38.1 | 12.1 | 47.8 | 0 | - | 1.58 | 0.0 | - | - | - | - | - | - | - | 100.0 | - |
| 22 | 57/741A | - | 24 | - | - | 3.0 | 45.2 | 5.4 | 46.4 | - | - | | | | | | | | | | | |
| 23 | 58/243A | - | 26 | - | - | - | 39.7 | - | - | - | - | | | | | | | | | | | |
| 24 | 57/780A | - | 38 | - | - | 2.5 | 33.6 | 16.3 | 47.6 | 0 | - | 1.58 | 21.5 | - | - | - | - | - | - | - | [illegible].5 | - |
| 25 | 57/548A | - | 13 | - | - | 2.3 | 40.7 | 14.6 | 42.4 | - | - | | | | | | | | | | | |
| 26 | 58/123C | - | 20½ | - | - | 2.7 | 37.6 | 10.3 | 49.4 | 0 | - | | | | | | | | | | | |
| 28 | 58/602A | - | 50 | 5 | - | - | 34.2 | - | - | - | - | 1.58 | 38.0 | 11.6 | 1.3 | 22.8 | 21.9 | 54.0 | 1 | - | 62.0 | 41.2 |
| 29 | 58/326A | - | 20 | 4 | - | - | 50.1 | - | - | - | - | | | | | | | | | | | |
| 30 | 58/322B | - | 35 | - | - | - | 31.7 | - | - | - | - | 1.58 | 34.7 | 11.7 | 2.8 | 17.0 | 23.8 | 56.4 | 0 | 0.7 | 65.3 | 39.5 |
| | A | - | 23 | - | - | - | 18.8 | - | - | - | - | 1.40 | 6.2 | - | 3.0 | 10.8 | 30.0 | 56.2 | ½ | - | | |
| | | | | | | | | | | | | 1.50 | 63.8 | - | - | 15.1 | - | - | 0 | - | | |
| | | | | | | | | | | | | 1.58 | 87.6 | 11.7 | 3.0 | 17.2 | 26.6 | 53.2 | 0 | 1.1 | 12.4 | 30.6 |

TABLE 2 (Contd.)

| Bore-hole | Sample No. | Thickness (in.) | | | Analysis of raw coal (air-dry basis) | | | | | | | Analysis of floats of 1½-in. coal (air-dry basis) | | | | | | | | | Sink | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Exc. | Sam-pled | Core loss | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | S.W. No. | S % | S.G. | Yield % | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | S.W. No. | S % | Yield % | Ash % |
| C. Alfred Seam (Contd.) | | | | | | | | | | | | | | | | | | | | | | |
| 31 | 58/779B | - | 23 | - | - | 2.3 | 34.8 | 18.7 | 44.2 | 0 | - | 1.58 | 18.5 | - | - | - | - | - | - | - | 81.5 | - |
| | A | - | 28 | - | - | - | 21.8 | - | - | - | - | 1.40 | 6.3 | - | - | - | - | - | - | - | | |
| | | | | | | | | | | | | 1.50 | 51.6 | - | 2.1 | 17.9 | 29.4 | 50.6 | 1½ | 2.7 | | |
| | | | | | | | | | | | | 1.58 | 81.9 | 11.9 | 2.0 | 19.6 | 27.9 | 50.5 | 1½-2 | 2.9 | 18.1 | 30.5 |
| D. Rider Seam | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 54/186A | - | 16 | - | 10.6 | 1.2 | 27.0 | 23.3 | 48.5 | 1 | 1.0 | 1.50 | 45.5 | - | - | - | - | - | - | - | 54.5 | - |
| 20 | 56/640A | - | 8½ | - | - | 2.1 | 11.7 | 34.2 | 52.0 | 2½ | - | | | | | | | | | | | |
| 24 | 57/781A | - | 12 | - | - | 1.4 | 20.5 | 27.4 | 50.7 | 3½ | - | | | | | | | | | | | |
| 26 | 58/123B | - | 6 | - | - | 1.4 | 17.5 | 22.8 | 58.3 | 2 | - | | | | | | | | | | | |
| | | 29 | | | | | | | | | | | | | | | | | | | | |
| | A | - | 9 | - | - | 1.3 | 20.8 | 23.7 | 54.2 | 2 | - | | | | | | | | | | | |
| E. Upper Gus or Gus Seam | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 54/416A | - | 32 | 1 | - | - | 10.0 | - | - | - | - | 1.50 | 96.4 | 14.0 | 1.0 | 9.3 | 23.2 | 66.5 | 1½ | 1.7 | 3.6 | 27.6 |
| 2 | 52/669A | - | 25½ | - | - | - | 10.6 | - | - | - | - | 1.50 | 80.8 | 14.1 | 1.3 | 8.7 | 7.7 | 82.3 | - | - | 19.2 | 18.6 |
| 3 | 53/214A | - | 31 | - | - | - | 12.8 | - | - | - | - | 1.50 | 91.1 | 13.8 | 1.1 | 11.1 | 26.1 | 61.7 | 6½ | 1.5 | 8.9 | 29.8 |
| 5 | 55/254D | - | 14 | 5 | - | 1.5 | 13.7 | 7.8 | 77.0 | - | - | | | | | | | | | | | |
| 6 | 53/589A | - | 27 | 3 | - | - | 11.4 | - | - | - | - | 1.50 | 87.7 | 13.8 | 1.2 | 8.7 | 7.5 | 82.6 | 0 | 1.5 | 12.3 | 30.4 |
| 7 | 55/147A | - | 21 | - | - | - | 14.2 | - | - | - | - | 1.50 | 75.1 | 14.2 | 1.3 | 9.8 | 17.2 | 71.7 | 0 | 1.8 | 24.9 | 27.5 |
| 8 | 53/699A | - | 13 | - | - | - | 13.4 | - | - | - | - | 1.50 | 86.6 | 14.0 | 0.7 | 10.5 | 22.3 | 66.5 | 5 | 2.1 | 13.4 | 32.2 |
| 9 | 54/187A | - | 47 | - | - | - | 17.9 | - | - | - | - | 1.50 | 66.1 | 13.1 | 0.8 | 12.0 | 28.4 | 58.8 | 3½ | 1.3 | 33.9 | 29.4 |
| 14 | 55/430A | - | 31 | 1 | - | - | 13.0 | - | - | - | - | 1.50 | 82.9 | 14.2 | 1.8 | 7.4 | 7.5 | 83.3 | 0 | - | 17.1 | 39.9 |
| 15 | 55/426A | - | 23 | 2 | - | - | 12.3 | - | - | - | - | 1.50 | 81.5 | 14.3 | 1.2 | 7.4 | 12.6 | 78.8 | 0 | - | 18.5 | 34.1 |
| 16 | 55/669A | - | 39 | - | - | - | 10.2 | - | - | - | - | 1.50 | 93.8 | 14.1 | 1.4 | 9.3 | 18.0 | 71.3 | ½ | - | 6.2 | 24.0 |
| 19 | 56/563B | 2 | 22 | - | - | - | 14.7 | - | - | - | - | 1.40 | 21.5 | - | - | 8.0 | - | - | ½ | - | | |
| | | | | | | | | | | | | 1.50 | 77.2 | - | - | 12.3 | 9 | - | 0 | - | | |
| | | | | | | | | | | | | 1.58 | 97.3 | 12.2 | 3.2 | 14.3 | 22.4 | 60.1 | 0 | 0.7 | 2.7 | 34.7 |
| | A | - | 32 | - | - | - | 8.4 | - | - | - | - | 1.40 | 96.2 | - | - | - | - | - | - | - | | |
| | | | | | | | | | | | | 1.50 | 98.4 | - | - | - | - | - | - | - | | |
| | | | | | | | | | | | | 1.58 | 99.0 | 13.4 | 3.3 | 8.1 | 31.1 | 57.5 | 1 | 1.1 | 1.0 | 40.3 |
| 20 | | | | | | | | | | | | 1.40 | 70.4 | - | 2.3 | 7.9 | 33.4 | 56.4 | 3 | - | | |
| | 56/641A | - | 23 | - | - | - | 14.5 | - | - | - | - | 1.50 | 73.6 | - | - | 8.3 | - | - | 2 | - | | |
| | | | | | | | | | | | | 1.58 | 87.3 | 13.2 | 2.1 | 10.5 | 31.2 | 56.2 | 1½ | 1.3 | 12.7 | 41.5 |

TABLE 2 (Contd.)

| Bore-hole | Sample No. | Thickness (in.) | | | Analysis of raw coal (Air-dry basis) | | | | | | | Analysis of floats of 1½-in. coal (air-dry basis) | | | | | | | | | Sink | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Exc. | Sam-pled | Core loss | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | Sw. No. | S % | S.G. | Yield % | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | S.W. No. | S % | Yield % | Ash % |
| E. Upper Gus or Gus Seam (Contd.) | | | | | | | | | | | | | | | | | | | | | | |
| 21 | 57/487A | - | 24 | - | - | - | 10.6 | - | - | - | - | 1.40<br>1.50<br>1.58 | 79.3<br>89.5<br>91.1 | -<br>-<br>14.5 | 1.0<br>-<br>1.0 | 6.9<br>-<br>7.8 | 20.1<br>-<br>19.9 | 72.0<br>-<br>71.3 | 1½<br>-<br>1½ | 1.0<br>-<br>1.5 | 8.9 | 39.4 |
| 23 | 58/244A | - | 14½ | - | - | 3.0 | 16.4 | 5.2 | 75.4 | - | - | | | | | | | | | | | |
| 24 | 57/782B | - | 9 | - | - | - | 28.9 | - | - | - | - | 1.40<br>1.50<br>1.58 | 2.3<br>24.5<br>51.5 | -<br>-<br>11.8 | -<br>1.7<br>1.8 | -<br>15.9<br>19.5 | -<br>23.6<br>21.8 | -<br>58.8<br>56.9 | -<br>1<br>1 | -<br>0.6<br>0.5 | 48.5 | 38.6 |
| | A | 1½<br>- | 31½ | - | - | - | 14.6 | - | - | - | - | 1.40<br>1.50<br>1.58 | 53.8<br>79.3<br>94.1 | -<br>-<br>13.1 | 1.5<br>-<br>1.5 | 9.5<br>11.5<br>13.1 | 32.1<br>-<br>28.9 | 56.9<br>-<br>56.5 | 7½<br>6<br>5 | 1.4<br>-<br>1.7 | 5.9 | 36.5 |
| 25 | 57/549A | - | 34 | - | - | - | 8.7 | - | - | - | - | 1.40<br>1.50<br>1.58 | 82.8<br>98.6<br>99.2 | -<br>-<br>14.2 | 1.6<br>-<br>1.7 | 7.5<br>-<br>8.4 | 22.3<br>-<br>22.1 | 68.6<br>-<br>67.8 | 0<br>-<br>0 | 1.0<br>-<br>1.1 | 0.8 | 36.0 |
| 27 | 58/388A | - | 48 | - | - | - | 6.3 | - | - | - | - | 1.40<br>1.50<br>1.58 | 73.4<br>96.7<br>98.8 | -<br>-<br>13.1 | 4.0<br>-<br>4.8 | 4.5<br>5.5<br>5.8 | 31.8<br>-<br>29.1 | 59.7<br>-<br>60.3 | 0<br>0<br>0 | -<br>-<br>- | 1.2 | 52.8 |
| 28 | 58/603A | - | 36 | - | - | - | 11.5 | - | - | - | - | 1.40<br>1.50<br>1.58 | 83.4<br>93.2<br>95.4 | -<br>-<br>14.0 | 1.2<br>-<br>1.2 | 8.4<br>9.5<br>9.6 | 28.3<br>-<br>27.4 | 61.6<br>-<br>61.8 | 6-6½<br>6½<br>6½ | 1.7<br>-<br>1.8 | 4.6 | 44.6 |
| 29 | 58/327A | - | 28 | 3 | - | - | 7.9 | - | - | - | - | 1.40<br>1.50<br>1.58 | 83.5<br>96.8<br>98.7 | -<br>-<br>13.5 | 2.7<br>-<br>2.9 | 6.5<br>7.3<br>7.5 | 35.3<br>-<br>34.4 | 55.5<br>-<br>55.2 | 1½<br>½<br>½ | 1.6<br>-<br>2.2 | 1.3 | 34.4 |
| 30 | 58/323A | - | 32 | - | - | - | 17.8 | - | - | - | - | 1.40<br>1.50<br>1.58 | 44.2<br>61.7<br>78.6 | -<br>-<br>12.3 | 2.8<br>-<br>2.9 | 10.3<br>11.4<br>13.9 | 33.4<br>-<br>29.7 | 53.5<br>-<br>53.5 | 1½<br>1<br>½ | 1.2<br>-<br>1.8 | 21.4 | 32.9 |
| 31 | 58/780A | - | 9 | 1 | - | 2.3 | 10.9 | 29.6 | 57.2 | 1½ | - | | | | | | | | | | | |
| F. Lower Gus Seam | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 53/215A | ½ | 35½ | - | - | - | 12.5 | - | - | - | - | 1.50 | 88.7 | 13.4 | 1.7 | 11.1 | 23.9 | 63.3 | 2 | 0.6 | 11.3 | 23.7 |
| 8 | 53/700A | - | 34 | - | - | - | 17.5 | - | - | - | - | 1.50 | 76.8 | 13.2 | 1.5 | 13.7 | 19.3 | 65.5 | ½ | 1.2 | 23.2 | 30.2 |
| 9 | 54/188A | - | 33 | 3 | - | - | 12.4 | - | - | - | - | 1.50 | 83.5 | 13.4 | 1.0 | 9.9 | 28.5 | 60.6 | 3 | 0.8 | 16.5 | 24.9 |
| 14 | 55/431A | - | 10 | - | - | 1.1 | 12.3 | 9.5 | 77.1 | 0 | | | | | | | | | | | | |
| 23 | 58/245A | - | 15 | 3 | - | 4.8 | 15.7 | 4.5 | 75.0 | - | - | | | | | | | | | | | |
| 24 | 57/783B | - | 25 | - | - | - | 12.7 | - | - | - | - | 1.40<br>1.50<br>1.58 | 29.1<br>89.9<br>98.4 | -<br>-<br>12.8 | 2.3<br>-<br>2.4 | 8.4<br>11.6<br>12.5 | 24.9<br>-<br>22.3 | 64.4<br>-<br>62.8 | 0<br>0<br>0 | 0.6<br>-<br>0.5 | 1.6 | 37.6 |

TABLE 2 (Contd.)

| Bore-hole | Sample No. | Thickness (in.) | | | Analysis of raw coal (air-dry basis) | | | | | | | Analysis of floats of 1½-in. coal (air-dry basis) | | | | | | | | | Sink | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Exc. | Sam-pled | Core loss | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | Sw. No. | S % | S.G. | Yield % | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | S.W. No. | S % | Yield % | Ash % |
| F. Lower Gus Seam (Contd.) | | | | | | | | | | | | | | | | | | | | | | |
| 26 | A | – | 31 | – | – | – | 12.0 | – | – | – | – | 1.40 | 67.3 | – | 2.0 | 8.7 | 29.4 | 59.9 | 2½ | 0.9 | | |
| | | | | | | | | | | | | 1.50 | 92.6 | – | – | 10.7 | – | – | 1½ | – | | |
| | | | | | | | | | | | | 1.58 | 98.0 | 13.2 | 2.2 | 11.6 | 27.1 | 59.1 | 1½ | 0.9 | 2.0 | 39.8 |
| | 58/124C | – | 41 | – | – | – | 18.8 | – | – | – | – | 1.40 | 32.1 | – | 1.6 | 9.3 | 27.1 | 62.0 | 3 | 1.7 | | |
| | | | | | | | | | | | | 1.50 | 57.0 | – | – | 12.3 | – | – | 1½ | – | | |
| | | | | | | | | | | | | 1:58 | 77.5 | 12.8 | 1.7 | 15.1 | 24.0 | 59.3 | 1½ | 1.6 | 22.5 | 31.6 |
| G. Dundas Seam | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 54/417A | – | 40 | – | – | – | 14.6 | – | – | – | – | 1.50 | 82.5 | 13.7 | 1.1 | 11.3 | 16.1 | 71.5 | 0 | 0.9 | 17.5 | 30.0 |
| 2 | 52/670B | – | 22½ | – | – | – | 16.8 | – | – | – | – | 1.50 | 61.9 | 13.6 | 1.3 | 12.4 | 8.8 | 77.5 | – | – | 38.1 | 23.9 |
| | | 2½ | | | | | | | | | | | | | | | | | | | | |
| | A | | 9 | – | – | – | 41.8 | – | – | – | – | 1.50 | 1.4 | – | – | – | – | – | – | – | | |
| 3 | 53/219B | 2½ | 39½ | – | – | – | 17.7 | – | – | – | – | 1.50 | 80.4 | 13.5 | 1.0 | 12.3 | 28.7 | 58.0 | 5½ | 0.9 | 19.6 | 40.0 |
| | | 6 | | | | | | | | | | | | | | | | | | | | |
| | A | – | 8½ | – | – | – | 24.6 | – | – | – | – | 1.50 | 61.1 | 12.5 | 1.2 | 18.3 | 26.6 | 53.9 | 5 | 1.1 | 38.9 | 34.4 |
| 5 | 55/254C | – | 13 | – | – | 1.6 | 20.3 | 8.5 | 69.6 | – | – | | | | | | | | | | | |
| | | 41 | | | | | | | | | | | | | | | | | | | | |
| | B | – | 7 | – | – | 1.5 | 14.8 | 8.1 | 75.6 | – | – | | | | | | | | | | | |
| 6 | 53/590A | – | 14½ | | 12.2 | 1.0 | 19.3 | 8.0 | 71.7 | 0 | 5.5 | | | | | | | | | | | |
| 7 | 55/148B | – | 27 | – | – | – | 11.4 | – | – | – | – | 1.50 | 93.0 | 14.1 | 1.2 | 10.1 | 220.5 | 68.2 | 2 | 0.9 | 7.0 | 15.9 |
| | | 30 | | | | | | | | | | | | | | | | | | | | |
| | A | | 7 | – | – | 1.4 | 25.9 | 19.4 | 53.3 | 2 | – | | | | | | | | | | | |
| 8 | 53/701A | – | 29 | – | – | – | 19.6 | – | – | – | – | 1.50 | 74.9 | 13.6 | 0.8 | 12.5 | 21.6 | 65.1 | 1½ | 1.3 | 25.1 | 40.7 |
| 9 | 54/212A | – | 41½ | – | – | – | 15.7 | – | – | – | – | 1.50 | 88.7 | 13.2 | 0.8 | 13.0 | 30.0 | 56.2 | 7 | 1.2 | 11.3 | 36.5 |
| 14 | 55/432A | – | 34 | – | – | – | 12.1 | – | – | – | – | 1.50 | 88.8 | 13.8 | 1.5 | 10.6 | 11.4 | 76.5 | 0 | – | 11.2 | 24.1 |
| 15 | 55/427A | – | 10 | – | – | 1.3 | 16.1 | 17.3 | 65.3 | 0 | – | | | | | | | | | | | |
| 25 | 57/551A | – | 24 | – | – | – | 16.8 | – | – | – | – | 1.40 | 53.3 | – | 1.4 | 8.9 | 22.3 | 67.4 | 0 | 1.1 | | |
| | | | | | | | | | | | | 1.50 | 79.1 | – | – | 11.4 | – | – | 0 | – | | |
| | | | | | | | | | | | | 1.58 | 87.2 | 13.6 | 1.6 | 12.5 | 20.4 | 65.5 | 0 | 1.2 | 12.8 | 45.7 |
| 26 | 58/124A | – | 30 | – | – | – | 12.8 | – | – | – | – | 1.40 | 65.7 | – | 2.0 | 9.3 | 29.2 | 59.5 | 2½ | 1.1 | | |
| | | | | | | | | | | | | 1.50 | 85.7 | – | – | 10.5 | – | – | 2 | – | | |
| | | | | | | | | | | | | 1.58 | 96.5 | 13.0 | 2.0 | 11.7 | 27.4 | 58.9 | 2 | 1.2 | 3.5 | 41.2 |
| | | 18 | | | | | | | | | | | | | | | | | | | | |
| | 58/125B | – | 9 | – | – | 1.9 | 22.3 | 29.7 | 46.1 | 4 | - | | | | | | | | | | | |
| 29 | 58/328A | 5 | 12 | – | – | 2.3 | 16.8 | 37.7 | 43.2 | 1½-2 | – | | | | | | | | | | | |
| 30 | 58/324A | – | 12 | – | – | 2.5 | 10.8 | 34.7 | 52.0 | 1 | – | | | | | | | | | | | |

TABLE 2 (Contd.)

| Bore-hole | Sample No. | Thickness (in.) | | | Analysis of raw coal (air-dry basis) | | | | | | | Analysis of floats of 1½-in. coal (air-dry basis) | | | | | | | | | Sink | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Exc. | Sam-pled | Core loss | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | Sw. No. | S % | S.G. | Yield % | C.V. lb./lb. | $H_2O$ % | Ash % | V.M. % | F.C. % | S.W. No. | S % | Yield % | Ash % |
| **H. Seam "Z"** | | | | | | | | | | | | | | | | | | | | | | |
| 25 | 57/742A | - | 6 | 4 | - | 1.3 | 22.0 | 19.1 | 57.6 | 0 | | | | | | | | | | | | |
| **I. Coking Seam** | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 52/777A | - | 13½ | - | 13.7 | 1.0 | 11.1 | 11.1 | 76.8 | 0 | - | | | | | | | | | | | |
| 3 | 53/272A | - | 28 | - | - | - | 11.6 | - | - | - | - | 1.50 | 95.0 | 13.8 | 1.0 | 10.3 | 30.8 | 57.9 | 7½-8 | 0.8 | 5.0 | 36.8 |
| 5 | 55/254A | - | 8 | - | - | 1.3 | 11.7 | 9.2 | 77.8 | - | - | | | | | | | | | | | |
| 6 | 53/660A | - | 11 | - | 13.3 | 1.3 | 12.8 | 7.7 | 78.2 | 0 | 2.1 | | | | | | | | | | | |
| 7 | 55/149A | - | 18 | - | 13.8 | 1.4 | 11.4 | 21.0 | 66.2 | 2 | 0.8 | 1.50 | 98.5 | - | - | - | - | - | - | - | 1.5 | - |
| 8 | 53/732A | - | 15 | - | - | - | 16.4 | - | - | - | - | 1.50 | 91.4 | 13.9 | 1.1 | 11.0 | 19.8 | 68.1 | ½ | 1.1 | 8.6 | 73.6 |
| 14 | 55/433A | 2 | 15 | - | - | 1.3 | 13.2 | 10.8 | 74.7 | 0 | - | | | | | | | | | | | |
| 15 | 55/428A | - | 21 | - | 13.9 | 1.2 | 11.0 | 15.4 | 72.4 | 0 | - | 1.50 | 98.8 | - | - | - | - | - | - | - | 1.2 | - |
| 16 | 55/670A | - | 24 | - | - | - | 12.0 | - | - | - | - | 1.50 | 92.2 | 13.8 | 1.5 | 10.3 | 12.9 | 75.3 | ½ | - | 7.8 | 32.0 |
| 25 | 57/743A | - | 18 | - | - | 1.3 | 9.3 | 19.4 | 70.0 | 0 | - | | | | | | | | | | | |
| 26 | | | | | | | | | | | | 1.40 | 86.3 | - | 1.9 | 8.7 | 33.7 | 55.7 | 5½ | 0.9 | | |
| | 58/125A | - | 24 | - | - | - | 11.5 | - | - | - | - | 1.50 | 91.0 | - | - | 9.3 | - | - | 5 | - | | |
| | | | | | | | | | | | | 1.58 | 95.5 | 13.7 | 1.9 | 10.0 | 32.8 | 55.3 | 4½ | 1.2 | 4.5 | 43.1 |
| 27 | 58/389A | - | 13 | - | - | 2.7 | 13.4 | 35.1 | 48.8 | 2½ | - | | | | | | | | | | | |
| 28 | 58/604A | - | 11 | - | - | 1.3 | 10.9 | 21.5 | 66.3 | 7½ | - | | | | | | | | | | | |
| 29 | 58/329A | - | 16 | - | - | 2.5 | 15.3 | 32.9 | 49.3 | 1 | - | | | | | | | | | | | |
| 30 | 58/325A | - | 6 | - | - | 2.4 | 19.0 | 28.8 | 49.8 | 0 | - | | | | | | | | | | | |
| 31 | | | | | | | | | | | | 1.40 | 29.2 | - | 1.6 | 13.3 | 33.1 | 52.0 | 6½-7 | 1.4 | | |
| | 58/781A | - | 20½ | 3 | - | - | 24.9 | - | - | - | - | 1.50 | 71.6 | - | - | 17.6 | - | - | 3½-4 | - | | |
| | | | | | | | | | | | | 1.58 | 82.6 | 12.2 | 1.7 | 18.9 | 29.5 | 49.9 | 4 | 1.4 | 17.8 | 52.0 |
| **J. Targas Seam** | | | | | | | | | | | | | | | | | | | | | | |
| 29 | 58/330A | - | 8 | - | - | 1.8 | 13.4 | 42.3 | 42.5 | 1 | - | | | | | | | | | | | |
| **K. Uncorrelated Seam** | | | | | | | | | | | | | | | | | | | | | | |
| 25 | 57/550A | - | 5 | - | - | 0.9 | 11.1 | 24.8 | 63.2 | 1½ | - | | | | | | | | | | | |
| 26 | 58/124B | - | 13 | - | - | 2.1 | 13.9 | 26.9 | 57.1 | 3 | | | | | | | | | | | | |

## TABLE 3

## COMPOSITION OF SAMPLES FOR FURTHER ANALYSIS

| Sample No. | Components | Parts | Description. |
|---|---|---|---|
| A. Gus or Upper Gus Seam | | | |
| 58/814 | 53/214 A F 1.50 | 282 | Floats of -1½ inches coal at 1.50 specific gravity. Alternating bands of dull and bright coal over the whole seam in bore-holes 3 and 24 on Klipplaatdrift 120. |
| | 57/782 B F 1.50 | 22 | |
| | A F 1.40 | 169 | |
| | A F 1.40 - 1.50 | 80 | |
| 58/815 | 52/669 A F 1.50 | 206 | Raw coal. Mainly bright coal over the whole seam in bore-holes 2, 14 and 15 on Noyeesboom 68, Gaatweel 11 and Pivaanspoort 66. |
| | S 1.50 | 49 | |
| | 55/430 A F 1.50 | 257 | |
| | S 1.50 | 53 | |
| | 55/426 A F 1.50 | 187 | |
| | S 1.50 | 43 | |
| 58/816 | 53/589 A F 1.50 | - | Floats of -1½ inches coal at 1.50 specific gravity. Mixed coal over the whole seam in bore-hole 6 on Politiek 67. |
| 58/817 | 54/416 A F 1.50 | 308 | Floats of -1½ inches coal at 1.50 specific gravity. Mixed coal over the whole seam in bore-holes 1, 7 and 16 on Boschhoek 183, Welgevonden 50 and Gaatweel 118. |
| | 55/147 A F 1.50 | 158 | |
| | 55/669 A F 1.60 | 366 | |
| 58/818 | 57/487 A F 1.40 | 190 | Floats of -1½ inches coal at 1.58 specific gravity. Mixed coal over the |
| | F 1.40 - 1.58 | 28 | |
| | 57/549 A F 1.40 | 282 | |

TABLE 3 (Contd.)

| Sample No. | Components | Parts | Description |
|---|---|---|---|
| | **A. Gus or Upper Gus Seam (Contd.)** | | |
| 58/818 | 57/487 A F 1.40 | 190 | Floats of -1½ inches coal at 1.58 specific gravity. Mixed coal over the whole seam in bore-holes 21 and 25 on Pivaans Water Vaal 267 and Elandsnek 4 |
| | F 1.40 - 1.58 | 28 | |
| | 57/549 A F 1.40 | 282 | |
| | F 1.40 - 1.58 | 56 | |
| 58/819 | 56/563 B F 1.40 | 47 | Floats of -1½ inches coal at 1.50 specific gravity. Mainly bright coal over the whole seam in bore-holes 19, 20, 27, 29 and 30 on Klipspruit 178, Vaalbank 103, Rustverwacht 151, Welgevonden 93 and Kalkkrans 313. |
| | F 1.40 - 1.50 | 123 | |
| | A F 1.58 | 317 | |
| | 56/641 A F 1.40 | 162 | |
| | F 1.40 - 1.50 | 7 | |
| | 58/388 A F 1.40 | 352 | |
| | F 1.40 - 1.50 | 112 | |
| | 58/327 A F 1.40 | 234 | |
| | F 1.40 - 1.50 | 37 | |
| | 58/323 A F 1.40 | 141 | |
| | F 1.40 - 1.50 | 56 | |
| 58/820 | 58/603 A F 1.40 | 300 | Floats of -1½ inches coal at 1.50 specific gravity. Mainly bright coal over the whole seam in bore-hole 28 on Schurvekopje 147. |
| | F 1.40 - 1.50 | 35 | |
| | **B. Lower Gus Seam** | | |
| 58/821 | 53/215 A F 1.50 | 310 | Floats of -1½ inches coal at 1.50 specific gravity. Mainly bright coal over the whole seam in bore-holes 3, 8, 9, 24 and 26 on Klipplaatdrift 120 and Uitzicht 113. |
| | 53/700 A F 1.50 | 261 | |
| | 54/188 A F 1.50 | 276 | |
| | 57/783 B F 1.40 | 73 | |
| | F 1.40 - 1.50 | 152 | |
| | A F 1.40 | 209 | |
| | F 1.40 - 1.50 | 78 | |
| | 58/124 C F 1.40 | 132 | |
| | F 1.40 - 1.50 | 102 | |

TABLE 3 (Contd.)

| Sample No. | Components | Parts | Description |
|---|---|---|---|
| | C. Dundas Seam | | |
| 58/822 | 55/432 A F 1.50<br>S 1.50 | 888<br>112 | Raw coal. Bright coal over the whole seam in bore-hole 14 on Gaatweel 118. |
| 58/823 | 54/417 A F 1.50<br>55/148 B F 1.50<br>53/701 A F 1.50<br>57/551 A F 1.40<br>F 1.40 - 1.50<br>58/124 A F 1.40<br>F 1.40 - 1.50 | 330<br>251<br>217<br>128<br>62<br>197<br>60 | Floats of -1½ inches coal at 1.50 specific gravity. Mainly bright coal over the whole seam in bore-holes 1, 7, 8, 25 and 26 on Boschhoek 183, Welgevonden 50, Uitzicht 113, Elandsnek 4 and Klipplaatdrift 120. |
| 58/824 | 53/219 B F 1.50<br>A F 1.50<br>54/212 A F 1.50 | 318<br>52<br>368 | Floats of -1½ inches coal at 1.50 specific gravity. Mainly bright coal over the whole seam in bore-holes 3 and 9 on Klipplaatdrift 120. |
| | D. Coking Seam | | |
| 58/825 | 55/428 A<br>55/670 A F 1.50<br>S 1.50 | 21<br>221<br>19 | Raw coal. Bright coal over the whole seam in bore-holes 15 and 16 on Pivaanspoort 56 and Gaatweel 118. |
| 58/826 | 53/272 A F 1.50<br>58/125 A F 1.40<br>F 1.40 - 1.50 | 266<br>207<br>11 | Floats of -1½ inches coal at 1.50 specific gravity. Bright coal over the whole seam in bore-holes 3 and 26 on Klipllaatdrift 120. |

## TABLE 4

## DRY ASH-FREE ULTIMATE ANALYSIS OF COMPOSITE SAMPLES

| Sample No. | Seam | Carbon % | Hydrogen % | Nitrogen % |
|---|---|---|---|---|
| 58/814 | Gus or Upper Gus | 85.5 | 5.0 | 2.2 |
| 58/817 | Gus or Upper Gus | 86.1 | 4.6 | 2.4 |
| 58/818 | Gus or Upper Gus | 87.4 | 4.7 | 2.4 |
| 58/819 | Gus or Upper Gus | 82.1 | 4.8 | 2.3 |
| 58/820 | Gus or Upper Gus | 86.2 | 5.1 | 2.4 |
| 58/821 | Lower Gus | 85.9 | 4.7 | 2.4 |
| 58/823 | Dundas | 86.7 | 4.7 | 2.3 |
| 58/824 | Dundas | 84.1 | 5.2 | 2.2 |
| 58/826 | Coking | 84.6 | 5.4 | 2.2 |

## TABLE 5

## ASH FUSION TEMPERATURES OF COMPOSITE SAMPLES

| Sample No. | Seam | Ash Fusion temperature (°C.) |
|---|---|---|
| 58/814 | Gus or Upper Gus | 1,240 |
| 58/815 | Gus or Upper Gus | 1,170 |
| 58/816 | Gus or Upper Gus | 1,180 |
| 58/817 | Gus or Upper Gus | 1,210 |
| 58/818 | Gus or Upper Gus | 1,290 |
| 58/819 | Gus or Upper Gus | 1,260 |
| 58/820 | Gus or Upper Gus | 1,150 |
| 58/821 | Lower Gus | 1,280 |
| 58/822 | Dundas | 1,260 |
| 58/823 | Dundas | 1,340 |
| 58/824 | Dundas | +1,400 |
| 58/825 | Coking | 1,270 |
| 58/826 | Coking | 1,280 |

# DIE STEENKOOLVELD VAN NOORDELIKE NATAL (GEBIED 2)

## DIE GEDEELTE NOORD VAN UTRECHT

## STATE VAN BOORGATE 1 TOT 31

## OPSOMMING

### DEEL I.- GEOLOGIES⁺

Die gebied noord van Utrecht is in 1937-39 geologies opgeneem deur J.J.G. Blignaut en F.J.J. Furter en die resultaat is gepubliseer in „Coal Survey Memoir 2, The Northern Natal Coalfield (Area No.2)" van die Geologiese Opname in 1952. Na die totstandkoming van die Steenkooladviesraad in 1951 is daar besluit om £ 100,000 aan te wend vir ondersoek deur boordery na die land se kookskoolreserwes. Die gebied noord van Utrecht was een van die gebiede wat aanbeveel is vir sodanige ondersoek. Vervolgens is daar vanaf 1952 tot 1958 voortgegaan met die boor van nog 26 boorgate (genommer 1 tot 31 met die weglating van 4, 10, 11, 12 en 13) om meer inligting te bekom van die steenkoollae in die Balelasberg. Dit is ŉ ingekerfde plato van 5,000 tot 6,000 voet bokant seespieël opgebou deur Karoolae, en geïntrudeer deur dolerietplate tot ŉ dikte van 460 voet. Die Karoogesteentes omvat van 10 tot 70 voet Onder-Eccaskalie, van 345 tot 940 voet sandsteen, koolstofhoudende skalie en steenkoollae van die Étage Middel-Ecca, 30 tot 475 voet Bo-Eccaskalie en 40 tot

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⁺ Opsomming deur P.J. Rossouw, Geologiese Opname.

270 voet sandsteen en skalie van die Onder-Beaufort. Aangesien die boordery gewoonlik sowat 80 voet onderkant die laaste steenkoollaag gestaak is, is die Dwykatilliet nêren raakgeboor nie.

Die steenkoolsone van die Étage Middel-Ecca wissel in dikte van 300 tot 450 voet, met ŉ gemiddelde van 330 voet. Daar is sowat 11 afsonderlike steenkoollae teëgekom waarvan die vier vernaamstes, die Alfred-, die Gus - (Bo- en Onder-Gus), die Dundas- en die Cokinglaag ongeveer in die middel van die koolsone lê en in die meeste gevalle ŉ ontginbare dikte van 3 voet oorskry. Die minder belangrike en dunner Bo-Eland-, Onder-Eland-, Fritz-, Rider-, „Z"-en Targaslaag lê bo-oor, tussen en onderkant die dikke lae.

Die Alfredlaag (ook bekend as die Moss) wissel in dikte van 12 tot 59 duim. Waar die dikte tussen 2 en 3 voet in boorgate 21, 22, 23, 24 25 en 26 in die noorde is, neem dit geleidelik toe na ŉ maksimum van bykans 5 voet in boorgat 30 in die noordweste. Dit bestaan uit mat, skalieagtige steenkool met blinkkool strepies hier en daar. Alhoewel van ontginbare dikte is die steenkool in hierdie laag van minderwaardige gehalte.

In die noordoostelike gedeelte van die gebied bestaan die Guslaag uit ŉ onderste laag wat deur 25 voet sedimente van ŉ boonste laag geskei word. Na die weste bestaan nog net die boonste laag, wat ook bekend staan as die Mainlaag. Die lae wissel baie in dikte, en wel vanaf omtrent 1 voet tot bykans 5 voet, maar hulle word oor die algemeen dikker na die weste. Die Onder-Guslaag bestaan hoofsaakli uit matkool met ʼn paar glanskoollae. Die Bo-Guslaag bevat alternerende mat- en glanskoollae.

Die Dundaslaag (Yard) bereik ʼn dikte van 56 duim en bestaan hoofsaaklik uit glanskool. Op baie plekke verdeel dit in dun lagies. Die Cokinglaag bestaan uit glanskool, wissel in dikte van 6 tot 29 duim, en toon ʼn afname in dikte van oos na wes.

Impregnasie deur natuurlike aardolie oor lengtes van tot 26 duim in grofkorrelrige sandsteen is in drie boorgate teëgekom.

Die steenkool is slegs op Klipplaatdrift 120 van ekonomiese belang. ʼn Reserwe van omtrent 115,362,000 ton is hier aanwesig, maar die lae kom voor op ʼn diepte van 974 oot 1,236 voet in ʼn bergagtige landskap.

## DEEL II.- CHEMIES EN FISIES [+]

Van die 26 boorgate in hierdie gebied, is in twee geen of feitlik geen steenkool aangetref nie. Boorgat 18 is buite die steenkooldraende gebied geboor en in boorgat 17 is feitlik al die steenkool deur doleriet vernietig.

Bo- en onderliggende dolerietplate het die steenkool in wisselende mate aangetas, sodat die volgende drie tipes steenkool aangetref is: dié met lae, dié met middelmatige en dié met hoë vlugstofgehalte.

Met die uitsondering van boorgat 28 is steenkool met goed ontwikkelde sweleienskappe alleen op Klipplaatdrift 120 en die aangrensende boorgat, nommer 8 op Uitzicht 113,

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[+] Opsomming deur S.W. van der Merwe, Brandstofnavorsingsinstituut van Suid-Afrika.

aangetref.

Die Eland-, Fritz-, Rider-, Z- en Targas-steenkoollae is deurgaans dun waar hulle raakgeboor is en is van geen waarde nie.

Die Alfredlaag is feitlik deurgaans van baie swak gehalte en is alleen van waarde oor die onderste deel van die laag in boorgate 30 en 31, waar ʼn gemiddelde asgehalt van 20.4 persent verkry is oor ʼn dikte van net oor 2 voet Die voorkoms is egter te beperk om van enige nut te wees.

Die onderste Guslaag is alleen oor die oostelike gedeelte van die gebied aangetref en die Coking-laag bereik ʼn dikte van 2 voet of meer alleen in boorgate 3 en 26 op Klipplaatdrift, boorgat 16, op Gaatweel 118, en boorgat 31 op Jericho 198. Laasgenoemde twee boorgate is egter in geïsoleerde kolle.

Gemiddelde analises vir die Gus-, Onderste Gus- en Dundas-steenkoollaag in dié gebiede waar hulle van waarde is word in die volgende tabel aangegee:

| Laag | Gus | | | | Onderste Gus | Dundas | | |
|---|---|---|---|---|---|---|---|---|
| Boorgate | 19,20, 27-30 | 3,9,24 | 1,7,15, 16,21,25 | 2,6,14 | 3,8,9,24, 26 | 3,9,26 | 1,7,8 | 2,14 |
| Steenkooldikte (dm) | 37½ | 36½ | 29½ | 29 | 40½ | 37 | 32 | 28 |
| Uitsluitsels (dm.) | - | - | - | - | - | 1 | - | - |
| Rukoolas (%) | 9.8 | 15.5 | 10.7 | 11.8 | 14.5 | 15.6 | 15.2 | 14.0 |
| Dryfstof van -1½" steenkool by 1.50 soortlike gewig: | | | | | | | | |
| Opbrengs (%) | 94.1[+] | 77.0 | 90.7 | 83.9 | 80.1 | 84.9 | 83.2 | 78.1 |
| Verhittingswaarde (lb./ lb.) | 13.2 | 13.4 | 14.2 | 14.0 | 13.2 | 13.3 | 13.8 | 13.7 |
| Vog (%) | 3.1 | 1.1 | 1.3 | 1.4 | 1.7 | 1.2 | 1.1 | 1.4 |
| As (%) | 9.3 | 11.6 | 8.7 | 8.2 | 11.5 | 12.1 | 11.2 | 11.2 |
| Vlugstowwe (%) | 29.5 | 28.1 | 19.4 | 7.6 | 24.7 | 29.0 | 19.0 | 10.6 |
| Vaste Koolstof (%) | 58.1 | 59.2 | 70.6 | 82.8 | 62.1 | 57.7 | 68.7 | 76.8 |
| Swelsyfer | 0-1½[++] | 3½-6½ | 0-1½ | 0 | ½-3 | 2-7 | 0-2 | 0 |

[+] Gemiddelde analises het betrekking op dryfstof by soortlike gewig van 1.58.

[++] Met die uitsondering van boorgat 28, waar ŉ swelsyfer van 6½ verkry is.